

## **Leaving the Research to the Experts: Collaborating with Anthropologists to Emphasize Core Competencies in Industrial Design Education**

John F. McClusky and Charles N. Darrah, San Jose State University

### **Introduction**

This paper explores the process and outcomes of using the discipline of anthropology to enhance core competencies in industrial design. It is grounded not in the lofty goals of combining disciplines, but rather in practical problem solving by two practitioners. Specifically, cultural anthropologist Chuck Darrah had conducted extensive ethnographic research in the Silicon Valley region of northern California, work that often provoked indications of interest by designers. Yet as interesting as the ethnographic data might have been, how it would inform designers addressing specific problems remained uncertain and the "hand off" of data to designer was never smooth. If indeed it occurred, he found that he had little say in how the information was interpreted or utilized design implementation. Industrial designer John McClusky encountered complementary difficulties since he first had integrated research into his design process during previous work with anthropologists at Xerox. Specifically, he found that the research findings often failed to provide a deep and broad understanding of consumers' assumptions and values that his designs were required to address.

McClusky and Darrah had attempted to resolve these shortcomings, initially by learning more about the other's discipline. Yet such "lite" approaches to anthropology or design are fraught with peril, and although they increased our sensitivity as connoisseurs of the other's expertise, they were no substitute for being skilled practitioners. Accordingly, we effectively returned to our respective disciplines, but with a renewed commitment to test the fit of our skills and knowledge in the context of practical problem solving. Darrah sought to be an anthropologist, albeit one who was sensitive to how designers approached their practice and who could frame his research in ways that supported it. McClusky sought to be a designer, but one who constantly tested concepts and images against the brute facts of how real people lived their lives and how they aspired to alter those lives. Ironically, our starting point had been to narrow the gap between ethnography and design, but to do so we discovered we had to fully understand our differences and the tension that sometimes resulted in order create the desired synthesis. The result has been tentative steps toward a synthesis that is fundamentally social and collaborative. Not located either in ethnography or design, but in our shifting roles in a dynamic problem space that brings together research and design.

This paper provides one perspective on the relationship between anthropology and design, and the way two practitioners, a cultural anthropologist and an industrial designer, have attempted to synthesize them. Significantly, this synthesis has occurred in an educational context dedicated to preparing designers as practitioners who are well rounded problem solvers who can develop actual products. Accordingly, the story this paper tells is one grounded in dialectic between our own professional practices as anthropologist and designer, and as educators who regularly work with students who desire the skills that will make them employable.

### **Cultural Anthropology and Design**

Cultural anthropology is a field of the broader discipline of anthropology, which includes archaeology, biological anthropology, and anthropological linguistics. Culture, to anthropologists, refers to the systems of meaning and interaction through which collectivities of people live their lives. It is learned through painstaking research into the minutiae of everyday life, and is far from high level abstractions such as western or eastern cultures. Anthropologists may focus on how individuals understand the cultural systems in which their lives are lived, but they are typically concerned with the fundamentally social processes through which meaning is generated. The anthropological perspective is also comparative in nature and its practitioners are suspicious of bold generalizations based on findings from one culture.

Ethnography is not a single research method, but rather a research methodology that ultimately links data collection with different levels of theorizing. It has, for better or worse, become a widely adopted, or at least proclaimed, tool in the contemporary researcher's toolkit, so that anyone today who conducts an interview is likely to identify themselves as an ethnographer. In fact, there is much more to it. First, ethnographers assume that they are to be taught by the people in the setting about what is important in order to act effectively in the setting. Ethnographers do not know all the questions before they set out to get the answers; they look to identify the right questions. Second, ethnography seeks to describe carefully and without judgment, thereby capturing multiple perspectives on a setting. The perspectives captured may be shaped by factors such as gender, level or position in the organization, ethnicity or national origin, and tasks or responsibilities—without assuming a priori which factors matter in a specific case. Third, while ethnographers may sometimes use surveys, they typically spend time participating and observing in the actual setting, and asking open-ended questions that may seem conversational. The goal is not to establish the extent of a known phenomenon; that is done best through quantitative research. Instead, it is to understand how a social setting “works” as a system of material objects, interconnected people, and ideas.

Design, by contrast, is a process of decision-making with the goal of shaping or making our environment “in ways without precedent in nature, to serve our needs and give meaning to our lives” (Heskett, 2005). How this decision-making process unfolds is debatable, but Zeisel (Zeisel, 2006) argues that it is comprised of the three elementary activities of imaging, presenting, and testing; that it uses information in two different ways (creating images and testing them); and that the process occurs through linked cycles of development. These cycles are directional, moving toward a domain of acceptable responses. Criteria of acceptability, issues of internal coherence, and contextual sensitivity all must be defined, and cannot be understood apart from specific cultural patterns (Rapoport, 2005).

Designers are thus faced with a range of alternatives from which to select the most appropriate given the priorities that rule the domain. This is where we look back into the data to determine 1. what are the priorities that determine appropriateness, 2. what goals will be better fulfilled with one of our new concepts, and 3. what unforeseen consequences may arise from the implementation of our new goods and/or services.

To summarize, anthropology and ethnography, on the one hand, and design, on the other, have similarities that provide a basis for collaboration. Both pay close attention to environments, and although they may conceptualize them differently, understanding the relationships between environments and human action are important. Likewise, each rests upon the assumption that knowledge can be used to improve the human condition. They also share a perspective on humans as having a capacity to intentionally create the environments in which they live; indeed, this capacity for creative adaptation is basic. Ethnographers and designers share a fascination with details, and a faith that ultimately it is those details of social and material life that matter. They also acknowledge the importance of time in their respective work. Ethnographers typically remain in the field for months or years (although shorter periods are more common in much design-related work) because the patterns of culture are not quickly learned. Although design may occur quicker, it still proceeds through multiple, complex iterations; product concepts, too, may not quickly reveal themselves. Finally, successful ethnographers and designers must consider the salience of multiple perspectives within and on a culture *and* a design concept.

Despite these similarities, differences, too, loom large. The anthropological gaze is upon people in social contexts, while designers are more likely to focus on individual users in physical contexts. Although research and data are relevant to each, for cultural anthropologists describing and understanding a culture is a valuable end in itself; documenting the variety of the human experience is a core disciplinary value. For the designer, research is a means to better problem solving: What fascinates a cultural anthropologist might bore a designer unless its implications for design are immediate. Likewise, a traditional tenet of cultural anthropology is that cultural systems are complex and interconnected, and changing them should not be undertaken lightly. Although such systems often appear and are described as natural, in fact they reflect hidden relationships of power; again, tales of unanticipated consequences of change abound in the field. Design is not so conservative since it requires a leap of faith into the unknown and accepting the risk of making that leap. A corollary is that designers often act to do things *for*

or to people, while anthropologists usually emphasize the importance of doing things *with* them. Finally, anthropologists deliberately analyze their own perspectives on the phenomenon they are studying. For example, if studying families, they will not simply assume “family” as a natural unit, but will ask what it means to different actors in the setting, including themselves. Similarly, when ethnographers work with designers, they do not assume that the latter are able to fully account for all the activities that resulted in a product; they problematize the very categories used to describe the process of problem solving. Put differently, when cultural anthropologists engage designers around a problem, they try to contribute information about the problem while simultaneously performing ethnography on the designers in order to expand the scope of possible solutions.

These similarities and differences generate tensions that force designers (and anthropologists) to resist preconceived notions or design intentions. Understanding the potential implications of a new design requires a deep understanding of the domain and those who operate within it. Here is where the anthropologist, with his or her loyalty to the data, can serve as the “champion of the domain” guaranteeing a more reasoned, methodical decision-making process amidst the often emotionally charged design selection process. Such loyalty to research data and human understanding keeps designers open to discovery. This helps in both the divergent and convergent aspects of design conceptualization. Initial concepts often narrow the focus of design, particularly in less experienced designers. A stronger understanding of deeper structural patterns of human behavior often provides a broader perspective informing a larger potential solution space. This openness to discovery helps fuel the divergent production in early concept generation. Likewise, the deeper understanding derived from strong ethnographic research helps design teams make better decision when determining which solutions would be most appropriate.

### **The ATM Project**

In order to explore the perspectives of anthropology and design, and how they can articulate, we developed class projects in which anthropology and design students focused on the same domain. Our subject matter for the classes was a centralized structure on campus where automated teller machines (ATMs) were located. Students in Darrah’s Ethnographic Methods class and McClusky’s Ergonomics in Design class separately studied the ATM site. Although the students worked on their projects separately, they were exposed to the perspectives, assumptions, goals, and methods of both disciplines. Darrah gave a lecture in the Ergonomics class regarding ethnography and McClusky discussed design and product development in the Ethnographic Methods class.

As each class progressed, students engaged in participant observation, subject interviews, identification of physical traces and other complementary methods of design and ethnographic research. The final deliverables in each class varied in that the anthropology students produced a research report and design recommendations and the design students were required to produce concept sketches, mockups and a report about their research findings and how it informed their design concepts. Not surprisingly, the results between the two classes varied widely. The students’ concepts in McClusky’s ergonomics class were creative and solved problems that individuals struggled with when using ATMs, but they all focused on the redesign of the ATM machines: heights, graphical interfaces, angles, surfaces, etc. were all modified. Darrah’s anthropology students presented a very different perspective focusing on the cultural activities that occurred in the space around the machines. Their design recommendations identified opportunities for providing seating, vending, and campus information; no one suggested the redesign of an automated teller machine.

### **The Human Aspiration and Design Laboratory**

This first experiment afforded us opportunities to discuss with students the articulation of ethnography and design, and those discussions were as important as the classroom outcomes. They provided the basis for our attempt to move the articulation beyond a series of discrete, ad hoc projects and to stabilize it around a process that could formally link courses and classes from year to year. The goal was to develop a means by which design and, ultimately, anthropology students could be competent designers who simultaneously incorporate the findings and methods of ethnographic research into their practices. The result was the Human Aspirations and Design Laboratory (HADLab) and its mission is “to help people achieve specific aspirations by employing the methodology of ethnography to develop design

recommendations that lead to specifications for goods and services.” HADLab assumes that design concepts that will improve people’s lives are hypotheses best based on empirical research. In effect, such concepts pose the question, “What if the built world was different?” There is, however, no reason to assume that design as a problem solving process should or can converge on single solutions, since multiple perspectives on the contexts which people live is a hallmark of 21<sup>st</sup>-century life.

Discussions of the ATM project in the context of student experiences also stimulated awareness that any formalized process could not just be based on providing students with settings and situations in which to conduct ethnography and then design, but rather it necessitated a set of propositions that made the student experience comprehensible and a way to link the activities of researching with designing.

Our discussions with the students and each other suggested that explicit propositions regarding our own practice would help students make sense of their experience, to move beyond their familiar “comfort zone” as design students, and to ultimately internalize a deeper and more robust perspective on the problem solving process in design. These propositions remain works in progress, for they are explicitly revised as new lessons are learned, but they underlie the choice of projects we undertake and how we hope to guide our students to approach them.

1. Design is inherently normative in that it rests on values about what the future should be like. Accordingly, the design process must necessarily incorporate human aspirations.
2. Design is directed at human activities and how they are (or are not) supported by artifacts and spaces. Designing should support activities consistent with people’s purposes and to suggest new purposes that are implied by their aspirations.
3. Research and design must explicate the systems of things, people and ideas in which artifacts and spaces are used. By looking for systems we are able understand people’s goals and purposes, and make inferences about absent systems (ones that should by inference be there but are not), missing artifacts (ones that should by inference be there but are not), and missing attributes, characteristics or functionality. Ideas about the future matter, since we hope to postulate what is not there—but could or should be.
4. Design must incorporate both macro- and microlevel phenomena. Problem solving moves from macro-level to micro-level (e.g., understanding the implications of a trend in individual lives) and from micro-level to macro-level (e.g., understanding the implications of particular practices for society); each is necessary.
5. In order to understand the individuals for whom we are designing, they must be connected to the larger social collectivities, such as families, groups, organizations and networks that provide definition and meaning. Likewise, we look at social level phenomena and try to trace their implications for individual lives.
6. Designing proceeds comparatively in both its divergent and convergent phases. Divergence is about generating alternatives and comparison across cultures can produce data that expands the problem solving process. Convergence is about using comparison to make analytical generalizations in order to identify potential causal relationships.

The challenge of linking researching and designing centered on the expectation that good research could unambiguously lead to design solutions. One pitfall was that design students could have excessive faith in ethnography to reveal the “right” problem or solution; another was they might jettison the data and fall back on their own experiences and aspirations, effectively severing the connection between research findings and design ideas. Creating good stories to stimulate idea generation while remaining faithful to the data emerged as the means to resolve this conflict by providing a platform for justifiable leaps of creativity. .Stories can provide multiple perspectives on practices and contexts in the future by ensuring that the assumptions, values and activities of different stakeholders are represented, thereby allowing us to understand how some ways of alleviating tensions or removing obstructions could potentially create difficulties for others. They provide the detailed description that supports visualization and, in fact, may be accompanied by visual renderings. Good stories are populated by realistic characters whose knowledge, values and actions are consistent with what has been learned from the case study. They allow us to develop realistic contexts for the material artifacts or props that support people acting in character,

including the ergonomics of features of the built environment. Above all, they keep our focus on activities and intentions, rather than on “cool” things that are detached from human aspirations.

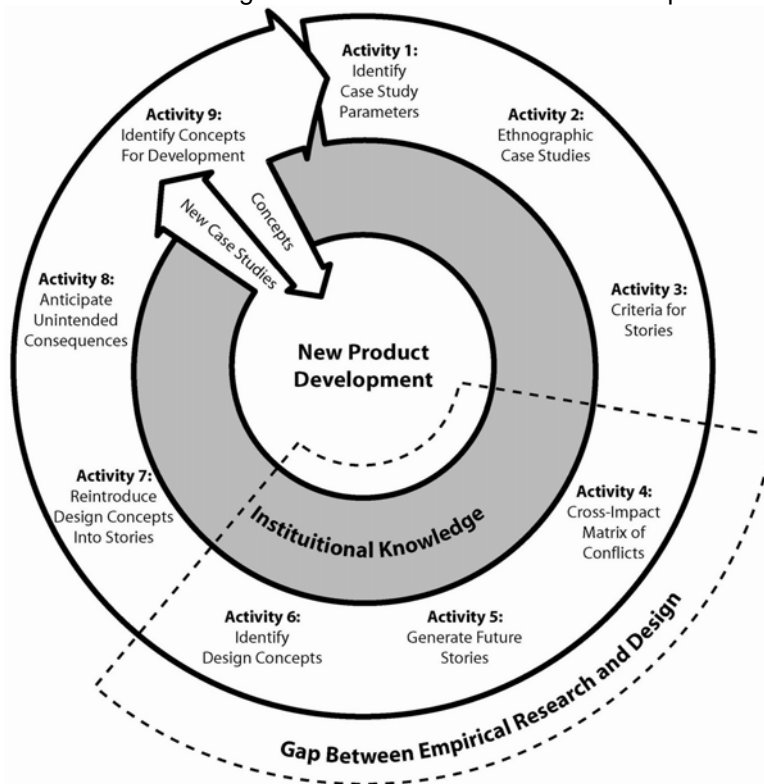


Figure 1. Human Aspirations and Design Laboratory Process Model (Phase Cycle).

Finally, we attempted to embed research, creating stories, and generating and testing design concepts in a spiraling, iterative set of activities that provided continuity between courses, cohorts of students, shifting design domains, and potential real world partners (Figure 1). In Activity 1, we program the criteria for conducting ethnographic case studies and how they can clarify the design challenge; conducting those case studies constitutes Activity 2. Ethnographic data can then be analyzed for criteria (Activity 3) that will guide us in developing stories that in turn can provide a platform for design. Activities 4–6 entail analyzing data in order to hypothesize possible conflicts among story criteria, generating the stories that allow us to explore different facets of the problem space, and then identifying design concepts as hypotheses that can provide solutions. These activities are located at the critical juncture between research and design. In Activities 7 and 8, the design concepts are introduced into the stories in order to facilitate a discussion about consequences, whether intended or unintended. The final activity is to choose design concepts for further development, which in turn can stimulate the need for follow on research.

### The Herman Miller Project

In the fall semester of 2006, the HAD Lab hypotheses were tested through a class taught by McClusky and sponsored by the design research group at Herman Miller Incorporated (HMI). In it, senior students in the industrial design program explored new ideas for goods and services that support new work behaviors. The class, fittingly enough, was held in an “incubator classroom” designed by IDEO for the Instructional Resource Center at San Jose State University. The room provided the class with Smartboards, tablet PCs, reconfigurable furniture, AV equipment, document cameras and videoconferencing capabilities. It was a boost to the project in that students would be able to try out current office equipment as they were trying to design it. Additionally, the Instructional Resource Center had also opened an area of community workspaces for students that were fully outfitted with HMI Resolve furniture systems. These provided students with first-hand experience in utilizing HMI’s current product offerings as well as provide invaluable dimension and materials information.

### **Capturing Initial Biases and Preconceptions**

We began the project by having the students design their ideal office environment. The goal of this exercise was to capture students' initial, impulsive ideas about work and office environments. In essence, the goal was to embrace their naiveté and capture the unrestrained ideas before students became too constrained in research information. The other goal was to help students feel a sense of personalization and ownership early in the process helping these students capture and understand their own views about work and office environments before attempted understanding the needs and values of others. This provided them with direct examples as to where their own experiences, preconceptions and aspirations may differ from the realities revealed in the research that would be provided in class.

### **Working with Ethnographic Case Studies**

Immediately following this initial two-week exercise, the class was given two proprietary case study reports from HMI. One was a synthesis of research on trends in work that had been produced by Darrah and several colleagues from the Department of Anthropology; the other was an ethnographic case study of a workspace prepared by Darrah under contract to HMI. A second HMI ethnographic report, completed by Darrah during the semester, was introduced midway in the semester, thereby providing the students with the experience of adapting to new information that could confirm or refute emerging design concepts.

The synthetic report was filled with observations, design principles, and stories about workers in Silicon Valley. The information had been reframed around possible design implications for Herman Miller, and it was prepared prior to the genesis of HADLab. Through the report students became aware of 1. the tasks high-tech workers performed, 2. the role technology played and the effect it had on their work, 3. the places where work occurred, 4. the artifacts that facilitated or hindered productivity and how they interacted with them, 5. how people acted and interacted to accomplish their work, and 6. the implications these findings may have on the design of built environments and systems developed to support work.

The first ethnographic case study was about a large piece-goods manufacturer in the southeast. This gave students an even more direct look into the inner workings of a company in its day-to-day operations. This report, like the previous one, included overview insights and implications for design. But, unlike the previous report, this one was a study as to what impact an actual Herman Miller installation had on the company operations. The second case study documented another Herman Miller installation at an architectural firm. It raised new issues, thereby reinforcing existing knowledge and refuting some (but not all) of the early concepts.

### **Case Study Trends**

From the case study research, our students began to identify clear patterns in the ways in which people work. The information in the reports was complimented with research that the students did on the "macroknowledge" trends that were happening in politics, economics, technology, materials, culture and the environment that specifically affected work environments, behaviors or organizational structures. At the beginning of the project, each student was assigned two of these categories in which they were expected to contribute 5-10 useful articles or information regarding trends in those areas.

The patterns of behavior revealed trends in 1. furniture, 2. space usage, 3. the placement of furniture, 4. use of the current systems, 5. the repurposing or reconfiguration of systems, 6. the artifacts that people interacted with in the spaces, and (7) how people interacted in small and large groups among other issues. These larger trends were documented in a couple of class wide brainstorm sessions the results of which were documented on Smartboards and posted on the web for all class members to access.

These patterns of use became the starting point for several small group brainstorm sessions. Students split into several small groups and were given one of the topics identified to brainstorm as many design concepts as they could come up with during a class period. These concepts were sketched on to Post-it notes and group on the tables or nearby walls. This is when we benefited greatly from the tools of the Incubator Classroom. Sometime during the brainstorm sessions, each group was tapped to take their stack of concepts and record them on the document camera at the end of the room. The document camera was used because of its ability to record these images at a more rapid rate than a flatbed scanner. As they were being recorded each concept was being projected for all students to see, labeled

with the topic and date, combined into a PDF file and posted on an ftp site to which all students had access. This meant that all the ideas generated in the multiple small group brainstorm sessions were not the property of one student but that of the entire class reducing the value of individual ideas so that they would not become an obstacles to achieving a broader range of concepts.

### **Project Updates**

Throughout the project students were required to send PDF format project updates to their assigned liaison at Herman Miller. The initial update became an eye-opening experience for many of the students. Accustomed to presenting their concepts in interactive dialogs with the class, most everyone underestimated the clarity required in a send out update. Communicating design concepts through a one-way medium such as email becomes a challenge even for the experienced designer. With this in mind we alerted our sponsors at Herman Miller that the first update may not contain all the information needed for them to understand the concepts and that they should request clarification as needed. This was a powerful learning experience for the students as they found themselves quickly adding a great deal of information and resending their revised project updates prior to an upcoming videoconference.

### **The Videoconference**

One of the more revealing situations that demonstrated the potential disconnects between research and design came during the first videoconference with Herman Miller. We met after the second iteration of project updates had been received by the company's liaisons. Much of the discussion centered on existing floor plans and images from other Herman Miller site visits. Throughout, the message was clear that several of the students were veering away from the research in favor of personal preference. The overwhelming message was that many of the students' concepts were not supported by the research information that had been provided to them.

Their updates included future stories as outlined in the HAD Lab process being taught in class. Disconnects arose when students wrote stories designed to support concepts that they had become attached to rather than stories that emerged from the research. There was the additional problem that many of the stories had been short, situational snapshots rather than stories about more complex interactions that occurred over time. Much of the research data provided to the students had identified that conflicts and obstacles arose at transition and interaction points where work was being done. Whenever the students' stories did not capture the richness of work situations, the concepts failed to do so as well.

### **Back to the Data**

The videoconference made it perfectly clear that the class needed to revisit the data in the reports to seek out the more meaningful interactions, situations and stories upon which to build their stories and design concepts. As originally expected, design students had a tendency to fall back upon their own experiences and aspirations which were not as directly connected to the work activities and environments in which their concepts would operate. Even with the clearest ethnographic studies, actually understanding someone else's world is challenging. Understanding it to the point where designers can effectively develop appropriate solutions is difficult for even a seasoned professional. But this is where the data serves to separate design decisions from personal emotion. Students who had been made aware that there were discrepancies between the information presented to them and the decisions that they had made viewed the information very differently than they had during the initial conceptualization phases. They became more conscientious connoisseurs of research and more empathic in their design decision-making.

### **Client Visit**

Within two weeks of the initial project updates and videoconference, a representative of the HMI research group visited the class to provide additional clarification and input. She and Professor Darrah toured the classroom as students explained their revised sketches. There had been a marked improvement in the decisions being made but some students still tended to lean toward their own personal preferences. This became particularly evident when the students were deciding between high- and low-tech solutions. There was an overwhelming tendency in students to naively select technology-based solutions over

simpler designs. The meeting provided one more opportunity for the champions of the research domain to redirect the young designers toward more appropriate concepts.

This final, preliminary review provided the clarity and proper connections within the data to help the students refine their stories and concepts so that they reflected the complexity and richness of the contextual situations. This clearer understanding combined with their own original interpretation enabled students to develop highly refined and appropriate final projects.

### **Lessons Learned**

Ultimately, the final concepts demonstrated evolutionary developments in work tools balanced with innovative leaps of faith. However, had the reports just been tossed “over-the-wall” to the designers the project most certainly would have resulted in less robust and appropriate design concepts. It was only through their continued exchange with Professor Darrah and the HMI research group that the reports could be interpreted into successful design solutions. This resolution was evident in an email sent in response to one student’s work from the head of HMI Research. In it he stated, “Wow. I am really impressed. This is a professional, mature presentation that shows both your talent and enthusiasm for design.” He went on to say, “You had a number of early concepts that were out there a ways. I have to admit that I was scratching my head at some of them. But that is the creative process! You are thinking systemically, which many designers can’t do until later in their careers. You were able to take one of your more achievable ideas, and bring it to life. [Student Name], you have demonstrated a grasp of the concepts that make the contract furniture industry an enigma to some. I am sure that the presentation will go well.”

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