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This paper falls under the "in/out" track, or rubric, described in the conference parameters.

This rubric poses the question "What is our response_ability to developing internal and external boundaries?"

Educating Design Process Educators as a Means to Educate Ethically Minded Designers

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Introduction

This discourse will argue that one of the most crucial objectives in contemporary university-level communication design programs should be to educate design students to become very effective "design process educators." This does not mean that all of the students enrolled in these programs need to be educated to one day assume roles as members of the professoriate in colleges and universities, although a select few will choose to follow this career path and thus do need to be well-prepared for embarking on it. Rather, it implies that these students need to be confronted with "design projects" that challenge them to teach each other and a wide variety of people who possess scholarly and professional expertise in disciplines outside design about how design processes can and do affect real economic, social, political and technological change. For this objective to be effectively achieved, an educational setting must be sustained that "incorporates [the] potential for analysis and, especially, transference and synthesis between and across disciplines as well as within disciplines (Loi and Dillon, 2006)."

Becoming a design process educator also implies that these students must accept the responsibility of explaining what designing can achieve in terms that are not their own, but that can be understood by people who have not been to design school. In this context, "design processes" entail the iteratively developed, heuristically guided, systematic series of actions that are undertaken as a means to achieve a result that will improve a given situation in one

of the four aforementioned arenas. These are the types of design processes that are initiated with an innovative proposition (Hatchuel and Weil, 2002), and which evolve according to how knowledge proposed by the designer is merged with knowledge of the person receiving or using that which is to be designed to make and distribute visual communications (or built forms and environments, apparel, experiences, etc.). This idea is essential to understanding *Concept-Knowledge Theory*, (a.k.a. *C-K Theory*), which accounts for how the decision-making processes that guide designing operate within the same framework as invention, creativity and discovery, and which proposes that designing is based on a logic of what Hatchuel and Weil describe as “expansion processes.” Articulated in a slightly more detailed manner, C-K Theory allows someone who is a design process educator to explain how designing:

- cannot be guided by logic that relies on the application or deduction of knowledge that already exists if it is to allow *new, heretofore unimagined objects/processes/systems* to emerge (Hatchuel and Weil, 2009), so—
- it must instead rely on reasoning that allows for new ideas to emerge as *concepts* (rather than as *briefs*, which can only attempt to describe objects that are not yet realized and about which much is unknown), and—
- that these concepts, which are neither inherently true or false, can only be
 - a. expanded, or b. validated or invalidated into successful designs according to knowledge brought to bear by—
- a. whomever is doing the designing, and b. whomever will use/consume/be affected by whatever emerges from a given process of designing.

By utilizing C-K Theory as a means to guide their design processes, and by explicating *why* they are utilizing it as they do, design process educators imbue themselves and their collaborators with the means to prevent assumptive reasoning from undermining or otherwise adversely affecting their approaches to planning and making. It can help prevent the practice of improving the efficiency of socially, technologically, economically or politically unethical or ineffective endeavors. These include the Byzantine configuration and operability of so many of the primary

computing interfaces that inhibit the timely and accurate entry of vital healthcare information into so many American hospitals' medical records systems, and the maintenance of the American nutritional labeling system on commercially sold food and beverage products.

Educating design students to assume roles as design process educators also demands that they should be immersed in learning situations that greatly expand their abilities to articulate the “why” of what they do much more than the “how.” It encourages an approach to designing that requires empathy-building to function as a primary element of its ethical foundation, and it challenges students to design the processes that guide their decision-making so that they can question answers rather than answer questions. *The primary rationale for this approach is based on the principle that empathy-building is the root motivation for ethical behavior.* To bolster the argument for educating design students to assume roles as design process educators, two learning experiences facilitated during the 2009-10 academic year within a leading design program in the southwest will be presented and analyzed.

Introducing Students to the Theoretical and Practice-Based Foundations That Underpin Design Processes

The first of these projects constituted the final major project in a first-year graduate-level course designed to introduce its students to how a select array of theoretical approaches to design decision-making and designing affect the practice of design “in the real world in real time,” as well as in the realm of the undergraduate design classroom, where many of them aspire to eventually teach. This graduate-level course was populated by MFA candidates from each of the design disciplines that facilitate terminal degree programs at our university—innovation studies (formerly communication design), fashion design and interior design—as well as one Master’s level candidate from our Department of Anthropology. Almost all of these students had accrued at least three years of professional, practice-based design or applied anthropology experience before being accepted into their respective Master’s level degree programs. Roughly half of them had amassed several years of creative project management experience, and for all but two of the ten students in the course, this project occurred during their first year of enrollment in graduate school.

The role of utilizing theory in design to inform its practice was something about which most of them had very little awareness, much less working knowledge. The idea that the marriage

of theory and practice could instigate and guide research regarding the design process—which is one of the core philosophies of the graduate programs in design at UNT—was new to them. Their lack of awareness of the potential knowledge yields that could grow out of this marriage was understandable given that pursuing research in design is, relative to pursuing research in other disciplines, still in its early stages of development. Design research is also still largely reliant on theories that have been appropriated from other disciplines, such as the social sciences, engineering and education, and on the not-quite-50-year-old work of pioneers such as Herbert Simon, Bruce Archer and J. Chris Jones. It also still suffers from being equated with various forms of rudimentary visual exploration and the comparatively simple observation-sans-analysis of naturally occurring consumer behaviors, which many designers still mistakenly refer to as “ethnography.” (“In its most emaciated form, the term is simply used to refer to a designer with a video camera [Wasson, 2002].”)

Real design research relies on the utilization of *design methods* to reveal or generate new knowledge that emerges from within design processes or that transpires as a result of engaging in them. It also produces or catalyzes the production of knowledge—which is at least in part created and defined socially and culturally—as a transformative force “that aids understanding, offers a glimpse of the surrounding world and creates cohesion and insight (Johansson and Linge, 2008).” The students enrolled in this course were being challenged to begin to discover or invent and then nurture three essential abilities, that, when combined, have the potential to yield the kind systematic knowledge that fuels creativity and the kinds of research collaborations that result in either innovation or invention. These are “(i) the analytic ability to recognize which of one’s ideas are worth pursuing and which are not; (ii) the synthetic ability to see problems in new ways and escape the bounds of conventional thinking; and (iii) the practical-contextual ability to realize new ideas and persuade others of their value (Sternberg and Lubart, 1999).”

The second of these two projects constituted the initial learning experience in a mid-level undergraduate communication design course designed to introduce its students to a select array of methods for designing interactive visual systems (most notably websites). The students who populated the undergraduate course were, with one exception, enrolled in the BFA program in communication design, and had no professional design experience prior to their being enrolled in this program.

Both of these projects were structured so that the culmination of each student's effort yielded a process for designing rather than a specific designed artifact or system. Making use of this approach required that students sought to construct or discover questions that challenged how extant perceptions, methods and criteria for determining success or failure are articulated. This approach also challenged the traditional notion that the impetus for a viable design project must be qualified within a *brief*, prepared either with or without input from the designer, that too often is written to ensure that a given design process will yield a pre-determined outcome.

Some of the students were able to articulate how they believed particular procedures, techniques, or ways of doing something (a.k.a. methods) would best support the respective processes for designing that each of them had proposed. Each student who was challenged to work on these projects began the experience as part of a diversely populated group with whom he or she had to interact to propose, operationalize, test, re-test and assess a model for approaching a hypothetical situation and suggesting a reasonable means to improve it. Both projects demanded that students use language precisely and articulately to propose and defend courses of action, to describe analytical processes and to defend rationales to other students whose educational backgrounds and belief systems differed from their own. In this manner, the students were sensitized to the idea that engaging in the routine practices inherent in their respective design disciplines is *not* research (Frascara, 2007). They also learned that real research is described by language that addresses and accounts for intentionalities that contextualize paths of inquiry, methodologies that define parameters and then yield data, which is then synthesized and analyzed and finally used to generate knowledge or support or not support a hypothesis.

Why "Messy" Projects Are Worthwhile Learning Experiences for Design Process Educators

Both projects were "messy:" getting to a well-refined aesthetic solution, sooner or later, was irrelevant to determining whether or not the final outcome each student produced was deemed effective or ineffective. Instead, the outcomes of these projects were assessed according to factors such as how well the students were able to utilize personas and scenarios as tools to guide their processes, how well they were able to articulate the manner in which what they had proposed could and would amplify the creativity of others, and how effectively whatever they were creating or proposing could and would open up the process of designing to others.

These projects were also messy in that they required students to work in ways that challenged them to actively seek and then effectively utilize input from people who define the essential and value-laden aspects of their lives very differently from each other and from the students themselves. In some cases, students working in groups attempted to adopt and model the personas of people whose backgrounds were very different from the backgrounds of anyone within the group. This research method allowed particular group members to attempt to account for how different sets of principles for assigning value (capital) to particular behaviors and personal characteristics guided the perceptions and the actions of people unlike themselves. Specifically, these were people who had not been raised in the American southwest, who had never been to an art museum as a child, who had not grown up with computers in their grade-school classrooms, etc. It was essential for the students involved in both of these projects attempt to model and then analyze behaviors that they had observed occurring within particular members of specific audiences or population groups when they encountered “frustration” during a given experience or event in their lives. By determining which aspects of this experience or event—in the realms of information design, graphical user interface design, advertising, children’s active wear, women’s sportswear, and small-scale retail space-planning—caused dissatisfaction among specific audiences or users, the limitations inherent in both the design of the experience or event and in the thinking that informed its development was exposed and could be better understood.

Introducing Failure Analysis as a Means to Encourage Students at the Graduate Level to Propose Design Strategies That Might Encourage Success

The graduate-level project challenged students to identify what they believed were failed or failing scenarios or situations in the realms of education or professional practice within or closely associated with their respective design disciplines or applied anthropology. Any situation or scenario they identified as a failure had to “have the potential to succeed” if it could somehow be re-cast, re-framed, re-organized, operated differently, operated in a different context, etc. These students had to analyze the causal factors that contributed to whatever they identified as a failed scenario or situation, as well as account for which groups of stakeholders within it had defined it as a failure, and what criteria these groups had used to inform this assessment. They learned how to analyze and then articulate how artifacts, systems and experiences that may have once been deemed “satisfactory” (or even “very successful”) can,

over time, with repeated use and wider exposure, can give rise to dissatisfaction among specific individuals or groups. They also learned that analyzing and articulating the causal factors on design decision-making that lead to dissatisfaction exposes the limitations inherent not only in a given design solution, but in the thinking that informed its iterative development.

Gaining a broad understanding of the aforementioned processes of designing challenges emerging communication designers to analyze how “what was once deemed satisfactory” can, over time and with repeated and ever-widening exposure and use, give rise to dissatisfaction among particular audiences. Analyzing the causalities of dissatisfaction that are the direct and indirect results of design decision-making exposes the limitations inherent not only in a given design solution, but in the thinking that informed the iterative development of that solution. As specific limitations, or *failures*, are identified, analyzed and understood more effectively, propositions for improving them emerge. In this way, the analysis of failures in design can have a prophylactic effect on future design processes, especially if they are examined in a manner that:

1. addresses their causalities in terms that aren't restricted within the bounds of formal criticism, and
2. addresses how they affect the perceptions and actions of those who interact with them.

Utilizing failure analysis as a critical methodology in university-level communication design education can achieve two primary objectives:

1. employing it to shape the manner in which the education of emerging communication designers can be approached philosophically and taught routinely, and
2. employing it to teach emerging communication designers to use propositional analyses as a means to help them broadly frame, edit and determine the criteria for measuring the relative success or failure of the projects they must work iteratively to complete.

The graduate students involved in this project then had to use whatever knowledge they had amassed to inform a suggestion for altering their chosen situation or scenario that could cause

it to be deemed successful. They were asked to carefully consider how the decisions made by designers can have far-reaching effects and affects on the lives of people who were never accounted for in a given project's design brief. They were also asked to investigate how that which may be deemed a "design success" according to criteria imposed by the cultural, political or economic value systems of one constituency may be deemed a "design disaster" according to criteria imposed by these same value systems of another. The end result of their collective and individual efforts were compiled into proposals that outlined and then detailed the means by which what they had identified as failures could be transformed into successes according to more broadly informed and broadly framed criteria. One of these began with a select team of students happening upon a systemic design failure when together they visited a local grocery store to buy batteries for one of the student's cameras.

This particular interdisciplinary team of graduate students was comprised of an applied anthropology student, a student with a corporate communication design background and a student with a fashion design background. They had been challenged by the author as part of a class assignment to identify an experience in a public environment that was essentially abetted by digital technology—some sort of a computer interface—that could be said to be failing to satisfy the needs or desires of a particular group. As they waited in the automated "check-out" line at the aforementioned grocery store to purchase the batteries, they observed two very different people who were in the process of attempting to make use that store's "express automated check-out system." The first person was a ten-year-old boy who was attempting to purchase two small packages of candy; the second was a woman "well-past retirement age" who was attempting to purchase several cans of pet food and a carton of milk. Both of these different types of users were frustrated after making three attempts to begin the process of actuating the systems in a manner that would allow them to begin using the laser scanners embedded in them to read the bar codes printed on the packages of the items they were attempting to purchase. Both were frustrated when they received warning messages from the system after they had failed to place their items in the designated area for bagging (neither wanted to bag their purchases, as the boy was carrying a backpack and the woman was carrying a large purse). Both experienced difficulty understanding how to "tell" the system to charge them the appropriate number of times for the same item. Both users experienced other particular dissatisfying interactions with the automated checkout system as their respective experiences evolved. These experiences culminated with the boy leaving his candy on the

scanning surface and walking out of the store as he loudly hurled expletives at the automated check-out system and with the woman having to call on one of the Assistant Managers for aid in completing her transaction. The fact that an Assistant Manager and an additional store employee were situated in a designated “self-checkout assistance area” near these machines was very revealing to the design team. They felt that if humans were necessary to facilitate the operation of what was supposed to be an automated system, a systemic design failure was occurring in this environment.

This experience led this design team to make three more trips to the same grocery store to observe the behavior of various types of customers as they attempted to utilize its the express automated check-out system. They were able to secure permissions from 19 different store customers (and the management of the store) to observe their respective interactions with the systems as they attempted to utilize it to pay for whatever goods they were purchasing. They identified what they categorized as six primary causal factors inherent in the design of the interface of the system that, either singly or in concert with at least one of the others, contributed to a distinct amalgam of dissatisfying experiences among 14 of the customers they observed.

The outcome of this particular failure analysis led this team to suggest what the criteria for assessing what a successful automated check-out experience at this grocery store should entail. It provided them with data they were able to synthesize and analyze and ultimately use to suggest how other failures in the system could inform design processes that might yield future successes. No suggestions for improving the actual physical design of the interface or the arrangement of the architectural components that surrounded and supported it were made during this process. These would (and did) come later, after new ideas presented as *concepts* could be validated and expanded further based on the knowledge generated during their respective explorations. The failure analysis conducted by this design team also demanded that the team frame their definitions of what caused the people they observed to experience dissatisfaction in terms that were empathetic to these users. This provided an ethically sound foundation upon which future design processes could be built to improve the functionality, the appearance and the overall usability of the automated check-out system.

A Brief Entreaty to Challenge Undergraduate Visual Communication Design Students to (Temporarily) Embrace Absurd Reasoning

The undergraduate-level project challenged students to design information architecture for and then utilize it to guide the design of an “absurdist” website. The process entailed placing each student in a group of three and asking them to assist each other in inventing a social, political, economic or technological issue that could provide the content necessary for the creation of a simple website. The issue had to be so absurd that convincing a given audience to understand it, much less care about it, required a great deal of thoughtful explanation and contextualization within each group and eventually to the entire class. Some of the issues that were proposed, critically defended and operationalized into websites included advocating for the protection of gay baby whales, advocating for the adoption of “The Fightin’ Naked Mole Rats” for the university’s athletic teams and advocating for social sanctions against people living in our state who make a regular practice of eating corn-on-the-cob vertically.

The final outcomes of these projects were not evaluated according to how well the design of their respective interfaces facilitated intuitive interaction, efficient functionality or a look and feel that was appropriate for the sensibilities of a specific audience. Of much greater import here was the evaluation of how well the processes undertaken by each group of students yielded broadly informed, well-articulated arguments for pursuing a particular course of action that had the potential to yield a viable website. Also of great import was the structuring of these arguments in a manner that had the potential to actually sway constituents to supporting the cause for which the students were advocating, despite its inherent absurdity. Inhabiting and supporting a cause that has no basis in extant logic, much less reality, challenged these students to build empathy on behalf of whomever or whatever initiatives their websites were designed to support in a unique way. They were unable to make broad use of pre-constructed ideas or social normatives as a means to contextualize the content they were attempting to deliver—they had to construct whatever content comprised their site based on an empathetic logic that they had to design “from the bottom up.”

C-K Theory provides rationale for how challenging designers and their collaborators to pursue “crazy concepts” that are based on absurd reasoning can reveal viable exploration paths that would otherwise remain undetected, much less investigated, during the evolution of a given design process (Hatchuel and Weil, 2007). It is important to understand that this rationale does not advocate actually pursuing the absurd, crazy concept path to a realized conclusion, but

that it does advocate developing and testing the knowledge that emerges as a result of hypothetically navigating them. Challenging emerging visual communication design students to create information architecture that informs the design of wireframe models that in turn informs the design for the less-than-fully articulated prototypes of websites that systemically examine how various “highly recognizable” styles of architecture have been depicted throughout the history of Japanese animé style animation is one example of this. The outcome of this process will be utilized by the designer who devised it to eventually help him define a more “sensible” means to explore designing other complex web interfaces that must make it easy for those who use them to navigate their taxonomies.

Conclusions

This paper encourages teaching emerging designers to participate in critical dialogue not only as a means to inform the iterative progression of whatever they have been challenged to make, but as a means to help them build empathy for those who will be affected by its realization, manufacture and distribution. A design student who is educated to comport herself as a design process educator as she designs learns that as she engages in endeavors that involve attempts to teach others, she herself must learn how they learn. This necessitates gaining and then using knowledge about how the internalization of the lived experiences within the particular contexts of whomever she is teaching affects how they emote, how they learn, and, ultimately, how they act.

Placing design students in learning situations that challenge them to teach processes sensitizes them to the difference between designing to attempt to satisfy ethical concerns and designing to attempt to satisfy moral ones. The former endeavors to affect (and effect) change that fulfills the real needs and perhaps even the desires of a given group of people as they themselves have qualified them. The latter imposes change in a manner that fulfills what people external to that audience have seen fit to decide as being right for them, and therefore necessary. Designing ethically means designing empathetically, whereas designing morally means designing assumptively. Educating design students to assume roles as design process educators helps facilitate approaches to designing that can yield outcomes that do much more real good than harm.

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