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Walking in the Shoes of Students: a Design-Based Reflective Analysis

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ABSTRACT

In this paper, we report on an interactive design process that was conducted in parallel with teaching reflection to obtain insight into how we engage our students in the concept of empathy and user-centered design. College-level design students often struggle to conceptualize and understand the needs of an end user for their products. To understand how better to help them, we reflected on student projects and assessment tools, then we carried out a design assignment to develop a map of how we ourselves engaged in the process of eliciting and implementing end user requirements. Our analysis suggested that reflection on emerging product design expertise might help students understand how they can frame questions to obtain end user responses, and how they can use that information to keep the end user in mind as they move forward with their design process.

Keywords: Empathy, user-centered design, emerging product design, design process

Introduction

The problem of how to help design students engage with the idea that they are designing for a person other than themselves is one that many design faculty consider on a regular basis. As instructors we are aware that novice designers sometimes struggle to imagine the needs of people outside of their own tightly defined circle. We build requirements into studio assignments that ask students to consider and describe their target customer, but how effective are those exercises in helping students to internalize the notion of the end user, this core principle of design practice? A recent exercise in reflection on teaching practice presented a vehicle for two faculty who co-teach a first year design studio to assess the efficacy of their strategies for facilitating student learning around the concept of engaging with and defining the needs of an end user. In order to provide insight into the key factor in the classroom: the student experience, we incorporated into our reflective approach a walk in the student's shoes, so to speak. We gave ourselves a design assignment, and used that assignment as a framework for reflecting on the student-as-designer experience as well as on our own instructional practices. In classroom project assignments, we ask our students to consider the needs of their end user through the practice of empathy, so it seemed appropriate that we would try to establish empathy with our students. In this

paper, we examine the results of this reflective exercise in the context of how we might improve our teaching practice around this core competency.

Literature Review

As practitioners of design we are aware that students need not only to imagine the needs of people unlike themselves, but also to have empathy for those people. Empathy involves putting aside one's own preconceived ideas and taking the other's perspective (Devecchi & Guerrini, 2017, Kouprie & Visser, 2009,). It is a key element in user-centered design, as it allows the designer to address customers' needs and wants in a design solution, and it is an important tool in any designer's toolkit. Kouprie and Visser (2009) described the need for "stepping into and stepping out of the empathee's life" (2009, p 444). They asserted that while connection is required to establish empathy, some distance from the subject is necessary for the designer to be able to act on what they have discovered, and that a range of skills is required for a designer to be able to let go of preconceived notions, prejudices, and judgment so they can receive the user's experience (2009). Students often struggle to take on the perspective of others, and may benefit from exercise that help them practice those skills (Haag & Marsden, 2018). How we as designers understand those abilities, and how we can frame them for our students is the focus of this project.

Methodology

This qualitative study was essentially a design practice that we framed in the context of reflective examination. As such, the researchers were themselves the subjects of the study. While a sample of two may be limiting, this project was intended to be exploratory, one that would inform future research on a larger scale. Both members of the research team are assistant professors in a design program at a university. The tacit knowledge held by each researcher was both program specific; we share the experience of teaching a first year design fundamentals course for fashion and textile design majors; and based on professional experience: we have both worked as designers. One of us has expertise primarily in textile design, while the other has experience primarily in apparel design.

The exercise of reflective analysis is useful in examination of practice in many disciplines. For our study it was a necessary element because reflection is something we require of our students. For each design project they complete, our students turn in a design journal, with visual research, drawings, color and texture studies, notes, and reflections. In qualitative research, reflective analysis is useful for identification of research questions on an emergent basis (Saldaña 2013). In this research, we employed reflection at several stages to identify questions, patterns, and opportunities with the intention of using those findings to revise or create new curricular materials and assignments. Qualitative data in the form of reflections, design process notes, and design artifacts were analyzed and coded with a view to developing curriculum tools (projects and assignments) to promote the expansion of empathetic practice on the part of students.

Results and Discussion

The reflective nature of the data generated in this project required a non-linear approach to analysis. Chronologically, we reflected on classroom assignments, then developed an assignment for ourselves, then completed that assignment, reflecting all the while. Unpacking the interactions between those reflective activities necessitated backtracking into the process. In our post hoc analysis of the design assignment reflections the themes we found took the form of a map of the design process that then informed our analysis of our teaching reflection. Here we first describe our design assignment and the related emergent themes, then we discuss how those themes related to our students' experience in analysis of our teaching reflection.

Design Assignment

The assignment we gave ourselves reflected our separate expertise as well as our shared interest in custom design work. We agreed that we would each work in our own area of specialty rather than trying to create a product together, so one of us would be focused on textile design, while the other focused on fashion design, each working toward the goal of creating a custom product for the other. In our reporting we refer to ourselves as designer or client, as applicable. Because we were not looking at specific textile design or fashion design insights, focusing rather on our collective experiential insights, it is not really important for the reader to remember who is reporting from which role at any given point.

We outlined our steps in an Assignment Brief (Table 1, below). We used journaling and note-taking to keep records at each stage and at the end shared our insights on the process.

Table 1. Assignment Brief

Process step	Tasks	Analysis
Design questionnaire	Conduct an online survey to determine baseline client needs/wants	Pause after each stage to analyze "what did I do" and "how did I know what to do?"
Design consultation 1	Based on survey results, present the client with visual images to facilitate conversation about product requirements.	
Design consultation 2	Based on results from Design Consultation 1, present the client with the next stage of product development (more detailed images, prototypes, etc.)	
Design consultation 3	If needed, a final consultation to show design concepts more fully realized	

In the sections that follow, we provide a description of activities and examples of artifacts that resulted from each of the steps above, followed by the map of the design process that emerged from themes we discovered. The most prominent themes related to our tacit knowledge as design professionals and educators. They can be divided into two categories; *communication* and *execution*.

Design questionnaire. The first step in the project brief was for each of us to create an online survey to capture some baseline design preferences. We elected to do this online rather than in person so that our preconceived notions of each other could be tested. We each needed to create a survey instrument that would capture something about the other's preferences that we did not know, or to help us understand better what we did know already. The challenges we noted in this step were as expected. We both had difficulty in formulating questions that would capture design preferences in more than a superficial way. Even open-ended questions were unsatisfactory in that we were not able to prompt for more detail where it would have been helpful. The most meaningful design insight in this stage resulted from one strategy we both employed. We each framed one question around the idea of associating an animal with design preferences. In our conversations and subsequent reflections about the experience of taking the survey we both noted that these questions introduced an element of play, enabling us as clients to relax a little and find enjoyment in the process.

Another learning from this stage was that the initial questionnaire needed to help the designer to narrow down product category options. This was comparatively easier to do for the fashion design category, as it seemed fairly natural to ask questions such as the following:

Table 2. Items from fashion design questionnaire

Are there some clothing items you wish you had more of but just can't seem to find in the right size/color/fit?
If you were given $500 that you had to spend on clothes for yourself, what would you purchase?
If you could have an artisan make a bespoke garment for you at no cost to yourself, what would it be?

For textile design, there are so many varied product categories it was more difficult to elicit specific client needs for this type of hypothetical project. The questions in the textile design survey focused primarily on color, fabric, and print design preferences.

The themes emerging from this step all related to communication. We identified *knowing what and how to ask* as the concept that stood out from this first stage of the project. Below is the beginning of a visual representation of the design process that illustrates themes and insights from our reflection.

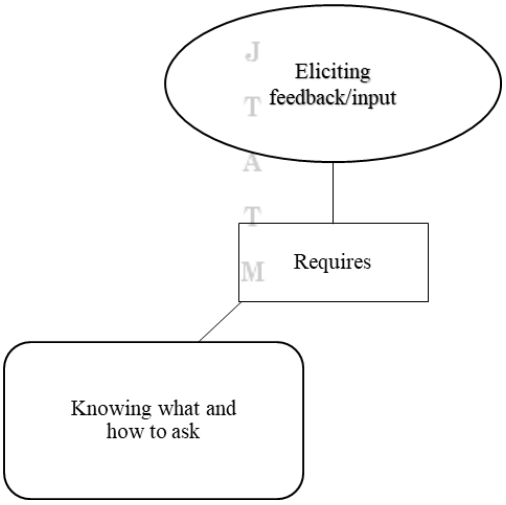

Figure 1. Design process map of emerging themes

Design consultation 1. After we each completed the other's questionnaire, we arranged an in-person meeting in which we would each share a visual presentation to communicate design possibilities inspired by questionnaire results. The textile design presentation focused on prints and colorways intended to help facilitate a conversation about print motifs, print style, color palette, and end use. The presentation included images showing several textile design and colorway examples.

The fashion design presentation consisted of thumbnail sketches done in two styles; quick gestural marker sketches, and pencil line drawings. Our notes from this stage related to the types of visual tools we both chose to use, shown in the figures below.

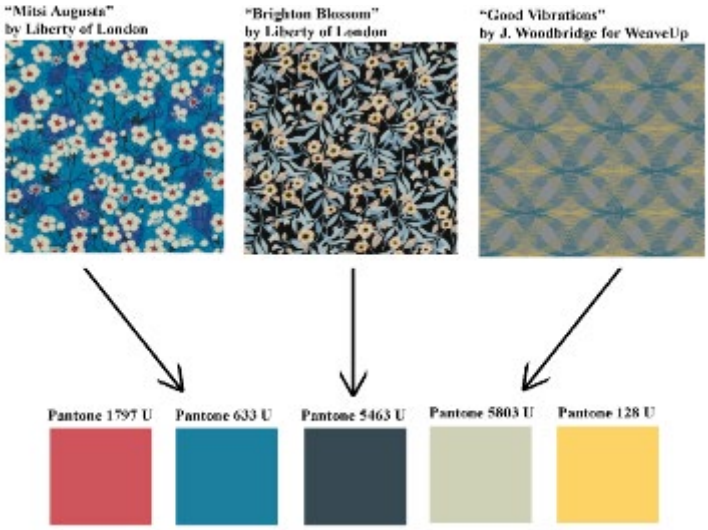

Figure 2. Samples used in textile design consultation one

Figure 3. Thumbnail sketches used in fashion design consultation one

We both felt that this conversation helped us to move forward, but noted differences in what that meant based on our product focus. Textile design examples were very helpful in eliciting feedback on both design options and end use. The textile designer noted

> I got pretty close to the client's needs on the choices of base cloths based on her questionnaire answers; however, I didn't quite hit what she wanted with the print design…it opened up the conversation to get closer - I felt good about the first meeting but had more work to do! I think I could have asked about specific design companies or artists in the questionnaire to get me closer.

It is worth noting that the textile design questionnaire included questions about color preferences that were specifically designed to elicit reactions to particular color combinations. In the survey, three sets of red and green color chips were presented, each with varying amounts of contrast, and the client was asked to pick their favorite. Through this question the designer was able to ascertain that the client preferred color combinations with high contrasting complements. The end result of the textile design conversation was a product direction (a printed scarf), a design inspiration (small floral print), and a color palette. At this stage the textile designer did not feel she had enough information to move forward with a

print design, so we determined we might have two more consultations rather than one.

The fashion design consultation focused first on specific garment elements based on the client's stated requirement for clothing that was easy to move in. The designer guided the client to look at different sleeve options, beginning with the line drawings. In this way we were able to eliminate several of the options right away based on sleeve preference. Once we narrowed down the choices, the designer focused the client's attention on the color sketches to see if there were styles she responded to based on color combinations. This part of the conversation touched on wearability and fabrication relating to the client's preference for pieces that could be worn to work, and that could be worn multiple times without wearing out or seeming repetitious. Here the designer's knowledge of garment construction came into play somewhat, but more significant was her prior knowledge of the client. She reflected,

> I felt like I was cheating a bit opting to do quick, expressive color thumbnails rather than detailed renderings. I knew the client would respond to that somewhat playful drawing style and that we would have productive conversations as a result. What I did not expect was that she would see so much in what I thought of as very simple drawings! She talked about seeing details that I had not imagined.

This consultation, too resulted in a direction, four dress styles that could be explored more closely in a 3D prototype. Examining our experience with this stage of the process, we could see two additional themes emerging: *knowing what to show,* and *understanding how to read responses.*

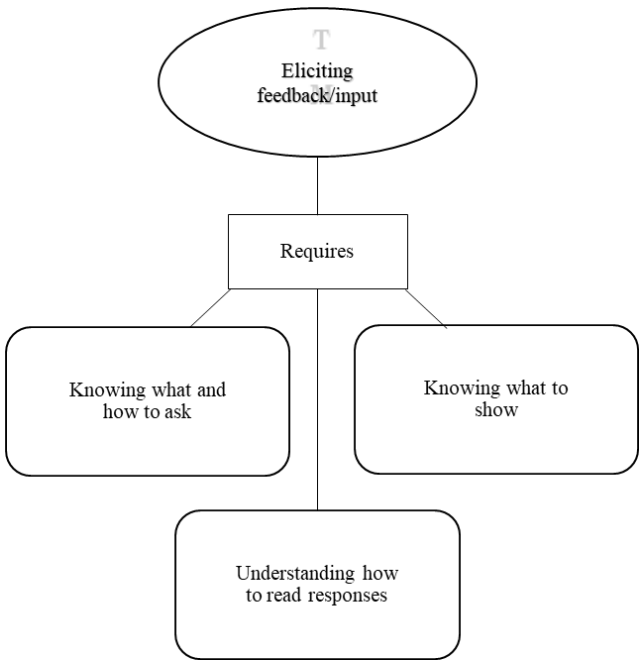

Figure 4. Design process map showing additional themes

Our findings thus far were focused very much on process. Our next steps were more product focused. We will briefly describe our final design consultations in the following sections, and then summarize findings related to those conversations.

Textile Design Consultations 2 and 3. In the next stages we each applied some of the product design tools we have at our fingertips. We met first to look at additional textile design research. The textile designer had identified small tossed floral patterns as

the preference of the client so she had several examples of those to share. In this meeting we talked about specific pattern elements and had a very fruitful discussion about motif density, background elements, and color distribution. Building on this conversation, the client shared some photographs of flowers that she liked. The textile designer felt that as a result of this meeting she could better observe what the client was drawn to. For our final textile design consultation, the designer showed a textile print based on preferences gathered in the previous two meetings, shown with process notes below.

Figure 5. Finished textile design with process notes

Fashion Design Consultation 2. For our final fashion design consultation, the designer created 3D simulations of four dresses the client felt most drawn to in our initial conversation. These dresses were patterned and simulated using CLO3D software. Simulations are shown below, with the client's favorite on the far left.

Figure 6. Four dress concepts in 3D simulation

Simulations were shown one at a time, starting with the dress the client had chosen as her favorite. This was a short sleeved color block shift dress. Working through each of the simulations one by one, we were able to use the software to visualize how they would look in different fabrics, with different color combinations. Seeing the garment on an avatar customized to her measurements enabled the client to further eliminate design concepts. She noted that dress two, while interesting, seemed to be much too fitted and formal for her comfort in everyday wear. She also noted that the two black dresses were very similar to styles she already owned, so were not as interesting as potential custom garments. The client noted that it took her a few minutes to get accustomed to seeing the dress on an avatar, but that ultimately it was helpful to be able to do so.

Findings from product focused stages. Reflecting on this stage, we became very conscious of how our own expertise allowed us to move quite easily into product visualization. Creating a print design requires skills in motif development, repeat set-up, and color management, and draws on skills in multiple software packages. Likewise creating a garment prototype requires the ability to draft and sew garment patterns. We could see a connection between our expertise and the products we created, but looking back over the process we also saw how that expertise was instrumental in helping us to elicit responses from each other early on that gave direction to our work. We had productive conversations, in part, because we know how things are made and about product categories and materials. In our analysis our design process map reflected that interaction.

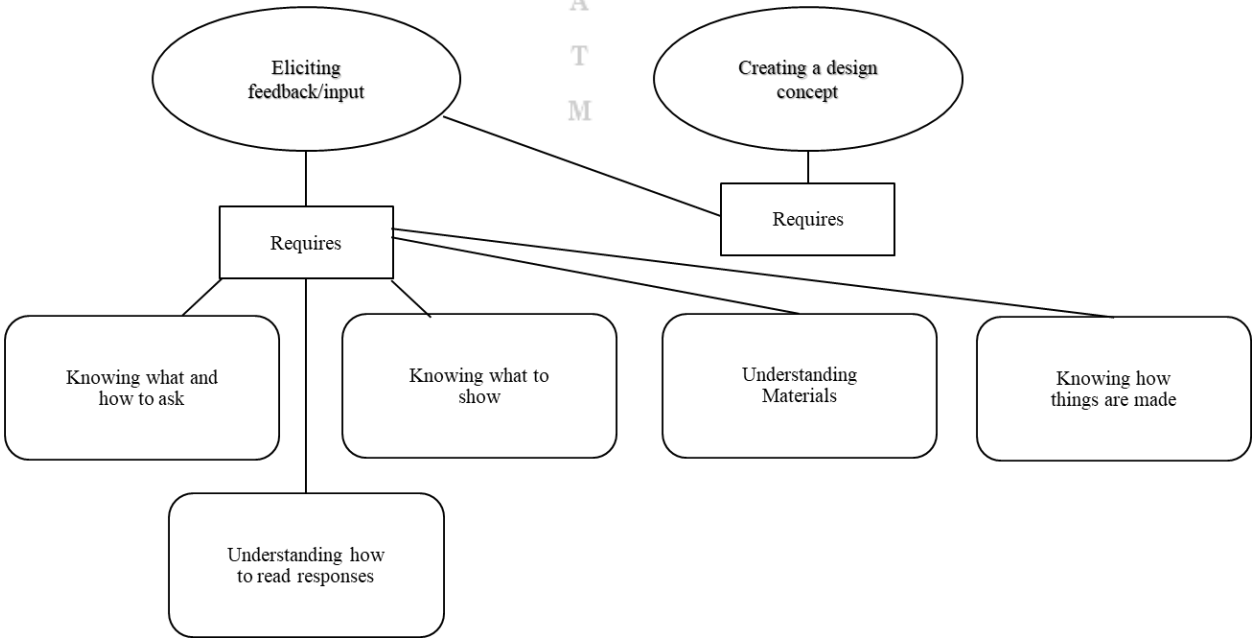

Figure 7. Design process map

Having identified and mapped these key themes, our next task was to look for the presence or absence of those themes in our reflections on studio project assignments. That analysis follows.

Reflection on teaching

The assignments we reviewed were two team projects that both had, as part of the deliverables, definition of an end user group. The analysis that follow is of our reflections on these assignments as well as the content of the assignments and project rubrics

themselves (rather than individual student-level work). We found that our initial reflections focused specifically on how we were asking students to engage with the idea of the end user explicitly in terms of how they were defining that group or how they were arriving at that group's needs. In other words, we focused on the outcomes rather than on the knowledge and skills that would contribute to the process.

We developed a visual representation of the assignments based on word frequency. This visualization technique, often referred to as a "word cloud" allows the researcher to quickly view trends and themes in a text. In our treatment, shown in figure 2 below, font size was assigned based on rate of use, with most frequently used words in the center and less frequently used words arranged as satellites.

Figure 8. Word frequency visualization generated from two design project briefs

This exercise revealed two interesting trends. The words *product* and *presentation* were quite prominent in our visual matrix, while the term *end user* was much smaller. It was clear that the concept of end user, while definitely present, was somewhat minimized in comparison to other topics.

In a deeper analysis of the project briefs, we looked in particular at the deliverables relating to end user definition. In Project One the students were given the exercise of creating a storyboard depicting a day in the life of their customer, while in Project Two the students selected and researched a group of children with specific developmental, physical, or emotional needs and presented an outline of their findings. We noted that,

> While the tool of a storyboard seemed to contribute to a richer visual communication of brand identity, we didn't have a means to give students feedback on how well they captured their customer's needs. In effect, because the students made up their customer, they were in the best position to assess their own performance in that area.

The Project Two design brief asked students in teams of four to develop a product based on functional parameters for children with specific needs or challenges. In their teams, students conducted research into physical, developmental, and emotional needs of children. They were required to present a problem statement backed up by research from reliable sources, and they developed product concepts based on this research. Reflecting on this project, we reported that

> Students were asked to engage in thinking about a group of end users who were far removed from the students' own experiences, but there was no real interaction with the end user, so there was no end user feedback.

For both assignments there was nothing in the rubric to address the effectiveness of capturing end user needs. Rather, the assessment tools focused on the quality of the presentation and the originality of the product concepts.

It is not surprising that our reflections on student assignments were primarily focused on the outcome, while our reflections on our own work were focused on process. The reflection on student work took place at the end of the semester, when grading and assessment were on our minds. In contrast, through our work and reflections on our design assignment we became conscious of the process, particularly of how our own expertise allowed us to move quickly into product visualization. We need our students to begin building those skills so that they can get to their outcomes in a more meaningful way. We want students to have the experience of receiving customer or client feedback on their ideas. Novice students, those who don't necessarily have the skills to fully develop a textile design or a dress prototype, could potentially receive that type of feedback at a stage in the process that they could manage. For example they could have that kind of conversation around a set of drawings or a mood board. What we found in reviewing our reflections, however, suggested that might not be enough. With each iterative stage in our own design process we were able to more clearly see how well we had performed in the previous step. The feedback helped us to complete the next task, the task then helped us to frame how we would elicit the next feedback, and so on. To be able to act on the empathetic process of capturing your customer's voice, you have to, as Kouprie and Visser (2009) suggest, step out of that voice and into your own expertise to be able to translate the customer's needs into a product. Students do not just need to be able to find out what people want. They need opportunities to observe how they can use the product design skills they are still in the process of acquiring to complement emerging skills in interpreting the needs of their potential customer. Reaching back to the themes of *communication* and *execution*, from our design process map, students need to build their people and product skills in parallel.

Conclusions and Future Research

As we reviewed our concept map, we reflected on the vast scope of opportunities within a four year design program to reinforce product design skills. Reinforcing and assessing observation and interpersonal communication is more challenging. We developed a list of what we are calling opportunity areas for referencing both process and people skills to be considered in both assignment deliverables and assessment tools.

Table 3. Opportunity areas for merging product and people skills

Themes emerging from our design practice	Possible implementation in studio assignments
• Knowing what and how to ask	• Build reflective questioning into early ideation tasks such as mood/concept boards, sketching, and working with inspiration
• Knowing what to show	• Require students to reflect on their presentations at all levels (drawings, sketchbook pages, samples)
• Understanding materials	• Ask students to reflect on how materials impact their own purchasing decisions

• Understanding how to read responses	• Ask students to engage in co-reflection on the design process. For example, in pairs students could imagine how they might interpret each other's designs
• Knowing how things are made	• Ask students to reflect on how their skill level affects their outlook on products and processes

These are not necessarily complete solutions, rather they are starting points for students to begin understanding a larger context for the process and product oriented skill sets they are focused on. One additional thought from our experience completing a design assignment was that we might find other opportunities to model that kind of collaboration for our students so that they can see the collaborative process of design in action. As well we want to explore lower risk opportunities for students to practice (i.e. when they are not receiving a major project grade) combining some of their product and people skills. As our teaching focus is on the first year of the four year program, we see potential to break down this list into manageable chunks to be worked with in short-term assignments, as well as points for students to practice reflection and self-analysis in longer-term design work. We plan to implement a pre-test/post-test model in our spring class to measure how much students grow in their understanding of the complex relationship between their design skills and the wider arena they will inhabit as designers.

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