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Sustainability Through A Systems-Based Design Process
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As a design professor with a Masters Degree in Environmental Studies, I am keenly aware of the role design can and must play in moving toward a more sustainable existence on this planet. In 1992, Richard Buchanan suggested that the creative power behind design thinking is “turning to the modality of impossibility” and suggests that “what many people call impossible may actually only be a limitation of imagination that can be overcome by better design thinking.” (Buchanan, 1992)

Design problems are “indeterminate” and “wicked” because design has no special subject matter of its own apart from what a designer conceives it to be. The subject matter of design is potentially universal in scope, because design thinking may be applied to any area of human experience. (Buchanan, 1992)

It has been suggested that the transition towards a sustainable human presence in the world is the wicked problem of the 21st century. (D. C. Wahl, 2006) But sustainability is not some ultimate endpoint, there is no stopping rule. “Designing for sustainability not only requires the redesign of our habits, lifestyles, and practices, but also the way we think about design.” (D. C. Wahl & Baxter, 2008) There are no quick fixes to this wicked problem, only better or worse outcomes. Designing for sustainability requires constant evolution and evaluation and diverse communities making flexible and adaptable design decisions on local, regional, national, and global scales. Transdisciplinary design dialogue is imperative and it needs to begin—for our young designers—in the classroom. The design process provides a roadmap for navigating the cyclical, adaptive, and unique qualities of wicked problems, but young designers need to be educated about their potential as the facilitators of this change.

In allowing students to work with multiple medias and approach problems from multiple perspectives, we can train students to prepare for the constant evolution of wicked problems. Being flexible and adaptable will be absolutely necessary and these are traits that must be nurtured and learned over a period of time, from foundational design studies onward.

When I began my Masters-level research in Environmental Studies, I did not necessarily consider myself to be an environmentalist. A mentor of mine suggested that I look into the Environmental Studies program at York University in Toronto and I was impressed by the broad range of scholars who called the faculty home. The MES program was receptive to my approaching my studies from a designer's perspective, so it seemed a good fit.

When I embarked on my research, I learned more about sustainability. Many—including myself—have associated the term with environmental perspectives, but by most accounts, sustainability is a perspective that focuses on social, economic, and environmental factors. According to the online Dictionary of
Sustainable Management, many organizations use the following criteria to assess sustainable products, services, and other activities:

Social Criteria:
- Socially desirable
- Culturally acceptable
- Psychologically nurturing

Financial Criteria:
- Economically sustainable
- Technologically feasible
- Operationally viable

Environmental Criteria:
- Environmentally robust
- Generationally sensitive
- Capable of continuous learning (The Presidio Graduate School,)

Sustainability refers to human and financial issues as much as environmental ones. The multiple perspectives inherent in sustainability encompass cultural impacts as well as ecological ones, financial constraints as well as physical limits, heritage and legacy as well as perspectives of our collective future.

As a designer, I began to see correlations between sustainability perspectives, and the design process.

The design process is at the heart of what I, and every other designer on the planet contributes to their practice, their studio, and their communities. The design process may differ somewhat with each designer, but at its core it is the means with which we are able to distinguish ourselves and make our services invaluable to any number of constituencies. The design process is what designers use to solve problems. It is a cyclical process which involves identifying a problem, imagining solutions, developing a plan, devising a solution, evaluating the results, and if necessary repeating the process over and over again. The process is malleable and can be applied to an entire system of complexities or used to focus on the minutest of details.

In the Nature of Design, David Orr writes:

Designing with nature disciplines human intentions with the growing knowledge of how the world works as a physical system. The goal is not total mastery but harmony that causes no ugliness, human or ecological, somewhere else or at some later time. And it is not just about making things, but rather remaking the human presence in the world in a way that honors life and protects human dignity. (Orr, 2002)

By its structure and by its nature, the design process lends itself well to this approach. Design problems often deal with improving upon existing systems, not just inventing new solutions. The design process is comprised of a set of stages that asks the designer to constantly engage with her subject matter, to envision ways of improving upon what is at hand, and to imagine new possibilities. If the designer is given the opportunity to use the process while...
engaging with others (be they other designers, specialists, or stakeholders in the problem) then the range of possibilities and the directions that her imagination will take her, will grow exponentially.

In *Tackling Wicked Problems*, Valerie A. Brown (et al.) writes:

> Being transdisciplinary in the broad sense requires the use of imagination. Without exhausting the possibilities, imagination is associated with creativity, insight, vision and originality; and is also related to memory, perception and invention. All of these are necessary in addressing the uncertainty associated with wicked problems in a world of continual change. (Brown, Harris, & Russell, 2010)

Design has often been labeled as being concerned primarily with the appearance of things. Be it graphic, interior, industrial, fashion, furniture, automotive, architectural, or any other mode of design, the societal perception is that designers are most concerned with aesthetics. But in truth, design has never really been about aesthetics, not exclusively. Design's expression of intentionality is also associated with creativity; and creativity with imagination; and imagination can be focused into much more than aesthetics.

Brown continues:

> Imagination has been central to the work of anyone who is involved in change in the society in which they live... It should come as little surprise that imagination plays an essential role in decision-making on complex issues. Accepting a central role for the imagination does not mean that we abandon standards for assessing the validity and reliability of the knowledge so generated; it indicates the potential for change and shows us where to look. (Brown et al., 2010)

In combining their understanding of the design process with the benefits of collaborative working environments as well as their gifted sense of imagination, designers—and perhaps even moreso: young designers—are in a unique position to help show us all where to look for the potentials for change.

Wahl and Baxter offer this sobering viewpoint:

> The transformation towards a more sustainable human civilization requires a process of inclusive and participatory dialogue that ultimately will turn visions of sustainability into reality. This will require the individual and collective participation of everyone. In the face of climate change, national and international inequity, social and ecological disintegration, and rapid resource depletion, nothing less than a societal and civilizational change—without precedence in scale and profundity in the history of our species—is urgently required. It
has to occur during the next few decades if humanity wants to avoid ecological and social meltdown. (D. C. Wahl & Baxter, 2008)

I am not suggesting that designers are the only citizens equipped to tackle the wicked problems Brown mentioned earlier, but I am suggesting that designers have the imagination and the creativity to contribute, and design education has a role to play in getting future generations of designers to be a part of the dialogue.

With regards to the systems-based perspective, Nathan Shedroff writes that the only way to address sustainability effectively is from a systems perspective. While I appreciate his wanting to simplify the terminology, we have to be careful—especially when things are already confusing—not to mix or blend our terminology too readily. ‘A systems perspective’ could easily be confused with Systems Theory, a specialization of Systems Thinking, popularized by Fritjof Capra, amongst others. In a talk entitled *The Systems View of Life*, Capra says that; “a sustainable community is designed in such a way, that its ways of life, its technologies and its social institutions honour, support and cooperate with nature’s inherent ability to sustain life.” (Capra, 2007) So there is obviously a great deal of overlap, and the sentiments are similar, but the knock against Systems Thinking is that if you are always trying to focus on the entire system, then you will never be able to focus on any one thing, and you may never find solutions to anything.

Shedroff qualifies his perspective of systems as: “the sum total of everything affected by an activity.” (Shedroff & Lovins, 2009) Which is to me, an interesting distinction. With this statement, Shedroff recognizes that there is a quantifiable amount of information that needs to be addressed, specifically within the activity that you are currently trying to work with. This approach to problem solving will still necessitate a great deal of effort, specifically in the research and development phases, to map out the actual systems that are affected by the issue at hand. This approach also focuses on many factors that are often not addressed in current development/design/problem solving ventures, which is why it is so important. Where Systems Thinking fails in that its perspectives are often too broad, sustainability prevails because it requires the developer/designer/problem solver to view as many perspectives as possible—to be certain—but within the parameters of the problem itself.

To simplify (or perhaps clarify) his thinking, Shedroff adds: “A systems perspective [from his perspective] requires an appreciation (at minimum) and an understanding (at best) of how various systems interact with each other. These include environmental, financial, and social systems.” (Shedroff & Lovins, 2009)

Sustainability does not require that our future developers/designers/problem solvers be experts in all fields, but in acknowledging all of the multiple perspectives related to the task at hand, they will approach their activities with more empathy and appreciation for all factors involved than most have up to this point in history.
I became a full-time Professor in the Art Fundamentals program at Sheridan College in the Fall of 2011 after ten years of part-time teaching in the York/Sheridan Bachelor of Design program. At the time, I realized that I had certain assumptions about the creative mind, but quickly realized that my perspectives had more to do with design-oriented creativity. The Art Fundamentals program is a 1-year certificate program for post-secondary students who wish to improve their portfolios and be exposed to a number of visual arts; 2D-Design being only one of their core subjects. Most of our students dream of becoming animators and illustrators. It was an opportunity for me to focus primarily on foundational design studies and to refine my own language when discussing design so that it might be understood by students who may have never been exposed to design thinking.

Adding to the challenge, the Art Fundamentals program at Sheridan College accepts 400 students every year and had not yet found the means or space to provide computers to each of these students. I was faced with having to teach a discipline whose industry is very much reliant upon the computer and its software using techniques that were decades-since extinct (primarily with marker renderings and gouache).

In choosing to see this situation as an opportunity, rather than a setback in my career, I began to shift my own perspectives of foundation-level design education away from the technical applications of design and toward the design process and how it is applicable to my students, regardless of the career path they choose in the visual arts.

This was also an opportunity to put my research into the connections between sustainability and the design process into practice.

Could projects be written so that multiple approaches in media might still accommodate learning outcomes? Could opening up options to the students in terms of how they create their work, become a metaphor for the kind of systems-based thinking that is required in approaches to sustainability?

As discussed, a sustainable approach to problem solving must include ecological, social, and economic perspectives. Additionally, the design process has a number of stages that help the designer to navigate the nuances of any particular problem. In both cases, holistic thinking is imperative and the perspectives of the former can absolutely be applied to the stages of the latter.

In working with my students, I have found that opening up options for more self-direction (such as providing a variety of media options—drawing, painting, 3-D construction, photography, and/or digital—for the production of their projects) as well as spaces for collaborative discussions in interpreting their processes (with classmates of differing socio-economic backgrounds, genders, sexuality, and dis/abilities) encourages open-minded inquiry, analysis, and imagination such that they are experiencing a type of systems thinking. In structuring foundations-level design courses in this manner, I am giving students an exciting glimpse at the possibilities a career in design might hold.
as well as providing them with a holistic view of their own creative processes. I believe that this holistic view has the potential to empower students to navigate evolving technologies and to tackle political, social, economic, and ecological problems we cannot possibly foretell.

For young designers, I see sustainability as an agreement with themselves, their peers, and their communities. It is an acknowledgment on the part of the individual that they will take more factors into account than an assignment or job stipulates. Sustainability requires more work; more research, more development, more trial and error, more refining. But if we can train our young designers to see beyond the immediate benefits of a product or service, and to look at the long term effects of its existence, then we can begin to move towards creating products and services that last longer, reach more people, and not only have less impact upon, but perhaps even improve the ecological, economic and social systems that impact our lives.

In conclusion, I feel I should add that not all students are created equal. Certainly, there is always a large portion of the students that simply don't engage in as much process as I would like to see and certainly don't always experiment with multiple medias on a consistent basis. But in interacting with classmates who are approaching the same project from different perspectives and in viewing the range of possibilities for a project when final solutions are presented to the class as a whole, I do feel that each of my students are exposed to the possibilities of a more systems-based approach. As the year progresses, I do see a sharp increase in the amount of process submitted by most all students. At the foundations level, perhaps that is all we can expect from most, but it is the exposure to the possibilities of the creative process—of a more systems-based way of thinking—that opens the door for more sustainable solutions moving forward.

Herewith, I include samples of work done by students of the Art Fundamentals program, within my 2D Design course at Sheridan College. I have written that my assumptions about the creative mind had more to do with design-oriented creativity. In teaching students who might not yet have considered design as a possible career option, I have found that many of my students don't have any pre-conceived notions of what design should look like. The range of artistic styles and abilities that they bring to the interpretations of these projects is inspirational.
Project: Animal Form with Type – Figure/Ground Relationships

Students start by creating a scientific illustration of an animal of their choice. They must then go through a series of abstractions of form until they achieve an iconic representation of their animal. This icon is then superimposed onto a letter form so that gestalt principles might be explored.
Project: Communicate the Meaning of a Word Typographically

Students must illustrate the meaning of a verb or descriptive (no nouns) through composition. There are no limitations in terms of the media used to complete the project.
Project: Easy As ABC

Inspired by Rick Valicenti’s Playground project, students design an alphabet using only found objects or environments of their creation. Letters may be documented through collage, photography, photocopying, digital and/or traditional illustration, and other appropriate mediums.
Project: Album Cover Design

Students design the album cover for a fictitious band of their creation. The names of the band and album are generated through a set of randomized procedures. Imagery for the album cover is created using a dollar store item selected in class. Students may photograph their object, illustrate it, or even use it as a drawing instrument.
References


