Design for Living Complexities

Peter J. Taylor
peter.taylor@umb.edu

Follow this and additional works at: https://scholarworks.umb.edu/cct_ccrp

Part of the Critical and Cultural Studies Commons, Environmental Design Commons, Environmental Studies Commons, Industrial and Product Design Commons, Interdisciplinary Arts and Media Commons, Liberal Studies Commons, Nature and Society Relations Commons, and the Organization Development Commons

Recommended Citation
https://scholarworks.umb.edu/cct_ccrp/5

This Article is brought to you for free and open access by the Critical and Creative Thinking Program at ScholarWorks at UMass Boston. It has been accepted for inclusion in Working Papers in Critical, Creative and Reflective Practice by an authorized administrator of ScholarWorks at UMass Boston. For more information, please contact library.uasc@umb.edu.
Design for Living Complexities

PETER J. TAYLOR

GRADUATE PROGRAM IN CRITICAL AND CREATIVE THINKING
University of Massachusetts, Boston, MA 02125, USA
http://scholarworks.umb.edu/cct_ccrp/5
Design for Living Complexities
Peter J. Taylor
Director of the Graduate Program in Creative and Critical Thinking,
University of Massachusetts Boston

This experimental course was developed in 2013-14, when I realized that the graduate program I direct, Creative and Critical Thinking (CCT), could be called Critical and Creative Design. The program is about practice more than it is about thinking; critical thinking and creative thinking are tools in changing practice. Students in the middle of their careers and lives try to change the direction of their practice and reflect on those attempts. In short, people in the program are mindfully designing their lives, as well as their engagement in work places, schools, communities, and other settings.

The course is about design, but not about the clever, creative, skillful design of wonderful logos or little machines. As fits CCT, this course addresses the intersection of design with critical thinking. Design in this course means intentionality in construction, which involves a range of materials, a sequence of steps, and principles that inform the choice of materials and the steps. Design also always involves putting people, as well as materials, into place. This happens by working with the known properties of people, as well as the known properties of material, and trying out new arrangements to work around their constraints (at least temporarily). Critical thinking, as I define it, involves understanding ideas and practices better when we examine them in relationship to alternatives (Taylor 2002). Design cannot proceed without the idea that there are alternatives to the current way of doing things, even if you have not yet found those alternatives, or have not yet found the best ones, or have not yet been able to put them into practice. So critical thinking is in design from the start.

Alternative designs are exposed and explored during the course through multiple lenses. First, design is explored through historical cases that illustrate how things have by no means always been the way they are now. Second, the class does archaeology of the present to shed light on what we might have taken for granted, relegated as someone else’s responsibility, or deferred to someone who is a specialist. Third, the class compares how things are arranged in different organizations and different cultures. And finally, through their own design sketches, students examine ill-defined problems in cases of real-world living complexity that invite a range of responses.
The design sketches are intended to be quick responses to the issues presented in a case or scenario. Students report back at the beginning of the next session, sharing what they have come up with and their reflections on their process. They are encouraged to articulate principles of critical thinking about design to add to those presented in the lectures. Similarly, readers of this text are invited to prepare design sketches, then share and discuss them on the public blog, https://designforlivingcomplexities.wordpress.com (also accessible through the short URL, http://bit.ly/dflcblog) and contribute your own critical thinking principles concerning design.

Session Topics

A. Everything is connected to everything else
   (which sets the scene for the subsequent alternation between opening out and focusing in)
   1. By-products as products
      B. Open out: Creativity is a process in context
         2. Play
         3. Gathering into community
         4. Enabling

C. Focus in: Well-managed learning
   5. Design-thinking education
   6. Craft, improvisation, innovation and uptake
   7. Standards, Conventions, Modularity and Infrastructure
      D. Open out: Transversality
         8. Local particularity
         9. Spanning distance
         10. Integration of diverse social and material worlds

E. Focus in: Refractive practice
   11. Keeping track
   12. Improving by taking stock

Acknowledgements

The transcription and editorial assistance of Karin Patke and Laura White is gratefully acknowledged.
Session One
By-products are Products

The first session introduces the critical thinking principle “By-products are Products” and explores this through the issue of waste. Waste is conventionally viewed as a byproduct generated in the process of making what is the intended product. However, waste can also be considered as a product because it is an unavoidable result of the design for making what we might call the focal product.

Barry Commoner (1917-2012), an influential ecologist, political figure and author of The Closing Circle (1971), popularized four laws of ecology, or what we could see as four variants of the lecture’s main principle about design. Commoner’s first law is “everything is connected to everything else.” As described in the blog post “Bird Flew” (Wallace 2013), after suburban and urban development reduced the coastal marshes in which snow geese had overwintered in the southern USA, the geese moved to feed on agricultural crops and their populations grew exponentially. At the northern end of their migration, these populations denuded areas of sedge, which, in turn, allowed salt infiltration and soil erosion, with consequent loss of habitat suitable for other birds and for invertebrates.

Commoner’s second law “everything must go somewhere” is illustrated in the video “Garbage Island: An Ocean Full of Plastic” (Vice Media 2012). The polymer bisphenol A makes hard plastics non-recyclable; the resulting waste products congregate in the middle of the Pacific Ocean in what is colloquially know as the Eastern Garbage Patch. In one sense, the waste from American production is going to the middle of the Pacific. In another sense, however, the system of production involves producing little pieces of plastic in the middle of the Pacific. Similarly, in the video “Sewers of Paris” (BBCExplore 2010), which focuses on an engineer’s attempt to address waste, there is a parallel universe where every street above ground has a street in the sewer.

(Commoner’s other two laws—“Nature Knows Best,” and “There is No Such Thing as a Free Lunch”—are not discussed here.)

At this point in the session, the class spends four minutes free-writing to try to identify critical thinking principles of design, especially in relationship to waste. (The idea in freewriting [Elbow 1981] is to develop your own thinking, to realize that you already have some ideas about the topic, or to begin to address what is confusing for you. Freewriting allows you to work on the issue yourselves rather than wait for the instructor to provide the well-honed principles. The
method involves writing without stopping. If you don’t know what to write you are free to write “Blah, blah, blah…” for a while or note down some things that are distracting you. Usually, those phases pass and worthwhile thoughts come to the surface.) I encourage readers to break and do the freewriting before moving ahead.

* * *

One idea that arose in my own freewriting is that, when people think about waste—or when we do not think about waste—what we are doing is assuming that someone else is going to clean up. That person may be far away in time, they may be in the future, they may be far away in another place. This latter assumption is prevalent in the disassembly and disposal of electronic waste. A corresponding critical thinking principle might be to ask “What would my waste be like if I had to talk to those people and get permission? If I have to take what has been invisible or not seen by me, and make it visible.” Perhaps readers came up with something similar, or something different, or perhaps nothing at all yet. Let us continue and see what emerges over the series of lectures ahead.

Returning to Commoner’s laws, a combination of the first two—“everything is connected to everything else” and “everything must go somewhere”—is evident in the teaching of an engineering colleague at Cornell University, Zellman Warhaft (2005). When he teaches his students about the engine and thermodynamics, he also teaches them about the atmosphere. The engine and the atmosphere are part of one system. The system shows: cycles—the level of carbon dioxide goes up in the winter when the trees are photosynthesizing less; progressive trends in increasing carbon dioxide and also, but with more variability, in average global temperatures; complex and complicating effects, such as changes in cloud cover; and great differences across countries—even those at the same standard of living—in per capita emissions. The engineer should not be talking about an engine on its own and, say, trying to make a car more efficient in terms of distance travelled per unit of fuel. The waste coming out of the engine, which includes CO2, is actually one of the products of the engine—just as the little pieces of plastic in the Eastern Garbage Patch are—with manifold consequences.

The critical thinking principle “by-products are products” can be stretched beyond the topic of waste. The video of Lamb (1995) derives from contact microphones placed on telephone wires, picking up noises that are not what we expect from telephone wires. In another case, an instrument, the cello, is played with a didgeridoo and the human voice (Hopkins 2011) in ways that resonate to amplify the harmonic overtones not usually noticed. In a final sonic video a
young guitarist uses the guitar in a percussive way that it was not designed for, but it certainly makes music (Riaz 2011). (Riaz seems to have seen someone on YouTube doing this with their guitar, then taught himself to do it. A by-product of the YouTube system is that you get new virtuoso percussive guitar players!)

The next two items of unexpected by-products concern the production of pharmaceuticals. The first one is about viagra, which may be a familiar story (Osterloh 2015). Clinicians were doing research on heart disease. Male participants reported back that they had increased erections after the initial dose. Even though the drug company was, because of various complications, resistant to more research on the drug for heart disease, they were eventually convinced to become involved in studies for what we now call “Erectile Dysfunction.” There are people who argue that almost every useful drug has had its utility discovered when researchers were exploring it use in another avenue of treatment.

The flip side of useful drug discoveries concerns thalidomide (Wikipedia Contributors 2017), which is notorious for having been prescribed in the early 1960s to pregnant women for their morning sickness. The result of the use was that many children were born with deformed and shortened limbs. There are many issues concerning this episode, including how thalidomide continued to be prescribed even when the drug’s value for morning sickness was not proven and when these side effects were already known. Currently, thalidomide is again being prescribed but only with very careful testing to understand other treatment options. In the end, it might prove to be a drug that has some positive benefits, not only its damaging by-products.

Other by-products that are useable by-products, even when that use is unexpected, include “weeds” (in quotes because what is a weed to one person might be useful to another). On her blog, Dusoulier (2013) lists forty-five different ways to eat Purslane, arguing that it is not a weed, but “a succulent plant whose edible delicious leaves are crunchy and slightly mucilaginous with a tangy lemony and peppery flavor.” In other words, if a weed is something growing where someone does not want it, someone else might be able to make good use of it.

Returning to the topic of waste, the next case is something we might have expected. In an Environmental Protection Agency report the agency describes municipal solid waste production from the 1960s to 2008 (EPA 2009). Municipal waste per person increased, then reached a plateau. Recycling of waste has increased over the same period—dramatically since the middle 1980s—on a total level, as well as per person. We could pat ourselves on the back for recycling more: increasing from 16 units to 84 units, that is, 58 units. However, in this same period the
total waste has increased from 168 to 350, an increase in 82—more than the total recycling. Some might say that the waste-reduction issue should never have been about recycling, but about reducing the level of packaging and waste. By putting an emphasis on recycling, we have managed to distract attention away from the initial project of reducing the total level of waste (including items that could be recycled), or even the per capita level of waste. In short, waste is a product of our consumption. Putting a smoke screen on the waste through the emphasis on increasing recycling is a by-product or product of such an emphasis. (An ideological component of this case worth exploring more is to ask whether people who recycle feel less concerned about the trend to more packaging now in comparison with 30 years ago.)

The last case for this session concerns Discard Studies, a new field of inquiry for researchers who are thinking about waste and how things are discarded. Examples of this work are evident in the essay “Modern Waste is an Economic Strategy” (Liboiron 2014), and the website, https://discardstudies.com, which aggregates information about scholarship in a form similar to a book or a catalog, highlighting tools for analysis, running workshops and even created a floating cabinet of contaminated curiosities (including what was shown on Vice Media 2012). The site includes a “Discard Studies Compendium” (Liboiron et al. n.d.) which presents concepts in alphabetical order.¹

To finish the first session, I invite students and readers to continue free writing on critical thinking principles about by-products as products, especially in regards to waste. You can share and discuss the results of the free writing and the session in the public blog, http://bit.ly/dflcblog. Ditto for the other eleven sessions to follow.

References


¹ A compendium of design concepts, included as Appendix A, includes topics beyond what can be covered in a twelve session course. As readers explore this compendium, think about what items are included and whether they convey or correspond to a design principle, especially a principle of critical thinking.


Taylor, P. J. 2002. “We Know More Than We Are, At First, Prepared To Acknowledge: Journeying to Develop Critical Thinking.” *Working Papers in Critical, Creative and Reflective Practice*. http://scholarworks.umb.edu/cct_ccrp/1


Session Two

Play

Design connotes intentional planning; holding that in tension with play becomes another theme for critical thinking about design. Play involves ongoing experimenting and adjustment, as well as putting people and materials into place. In that sense, intentional planning and play work together as a yin and yang of design.

This session revolves around three videos. The first profiles the team of Ray and Charles Eames, who incorporated collaborative play in their design work (Demetrios 2007). Although the emphasis is on putting materials into place as they construct models and prototypes, they are also playing with people when, for example, the Eameses looked for commonalities between people in the United States and in the Soviet Union.

The second video, from the MIT Media Lab, places both materials and people into place (Lifelong Kindergarten 2014). Mitch Resnik and Natalie Rusk, key members of the Life Long Kindergarten group, visit a computer clubhouse in Boston, one of many computer clubhouses that have opened across the world during the past twenty or so years. We see play in the sense of modeling and prototyping, in not expecting things to work the first time. We also see play in the way people are encouraged to work with their peers. Indeed, through that peer work and that play in working on projects, people find and develop their passion. Projects, Passion, Peers, and Play are the Four Ps of the Lifelong Kindergarten approach presented in their open online course “Learning Creative Learning” (Lifelong Kindergarten n.d.) With regard to the yin and yang of design, people have a project—something they want to do—but they don’t simply decide they are going to do it and it works; there needs also be an area of play.

The video does not show children in this space, only some teenagers. Who else is not shown? We might wonder: Why not have clubhouses for adults or seniors? How would we extend play to older ages? The video mentions maker spaces, a movement that is growing in the United States, in which people gather together in spaces where tools and equipment are made available. The theme of session three, “Gathering into Community,” comes up in the attraction of having a lot of equipment available in the lightly supervised space of a computer clubhouse, as well as in the mentoring of a young woman who talked about how she mentors the mentors.

The third video is predominantly about the people dimension of play (Paley 2009).
Vivian Paley talks about the role of mentors and teachers; later we will talk about some of moral lessons in her work. As a kindergarten teacher Paley wrote many books based on, more or less, a year of her teaching and the questions she was puzzling over that year. The books are short, easy to read, and very moving. The two I want to focus on with respect to the theme of play are You Can't Say ‘You Can't Play’ (Paley 1993) and The Girl With The Brown Crayon (Paley 1998). In both books she talks to the children after listening to stories and they build plays to enact the stories and address other concerns arising.

Paley’s classes were very mixed in terms of ability, behavioral problems, race, and class. There were plenty of students who had quite severe problems of social interaction. Now, when children say to others “You can’t play with us,” they are excluding them. So Paley talked with her kindergarteners about the idea of a rule that you can't say that to any other child. To foster these conversations, she also talked to first graders about the rule, heard what they had to say, and brought their responses back into conversation with the kindergarteners. Next, she went to the second graders and brought that back to her kindergarten class. And so on. When she talked to the fifth graders in the school, it seemed very sad. They were being asked to imagine a world with the rule that would have meant that they couldn’t have been excluded. But exclusion was already part of the furniture for them—the way the world is: they knew about exclusion from groups, or about fear of being excluded from groups.

After Paley conveyed the reactions from the other grades to the kindergarteners, they talked about the rule in relation to concrete cases of children in their class that were very difficult to include. Then Paley said, in effect, “So now we're going to follow this rule.” The children replied, “Oh no, we thought you were just talking about it!” Still Paley’s students actually really tried hard to put it into practice.

It was a very profound moral lesson I think they were being given. I am sure my life would have been quite different if I had learned that lesson at that time when I was just beginning to go to school, or at least if there were adults capable of making that rule real in practice. I recommend that, if you are interested in play, you should also be interested in the moral implications of the “you can’t say you can’t play” rule and think about its extensions into the adult world.

The other book by Paley I want to focus on, The Girl With the Brown Crayon, links with the next theme, “Gathering into Community,” but, as will be seen, it circles back to play in due course. The book describes Paley’s last year of teaching before retirement. I reread it a few years
ago when teaching a unit of another course on “Creativity in Context.” I was exploring an alternative to the idea of creativity as something individuals get, or have, or are encouraged to express. Instead, we can think about the way creativity occurs in context, built by the actions of people, such as mentors and teachers, and also by interactions with other people trying to develop creativity. Taylor (2013) presents the notes I made while reading the book. Let me go through a few them to convey some specific points.

“Reeny” was the girl referred to in the book title. She was a genuine leader at that age, willing to lead children into unexplored territory. The first quote I recorded is: “Kindergarters are passionate seekers of hidden identities and quickly respond to those who keep unravelling the endless possibilities” (Paley 1998:4). My notes then ask, “what prevents adults being passionate seekers of hidden identities?” That response makes me envisage a course where this is the spirit, where we recognize that parts of our identities are hidden, maybe even to ourselves. In the course we would try to unravel the endless possibilities of getting clear about our identities, or even developing our identities further.

Paley’s class focuses that year on books by Leo Lionni, most of which present a struggle between self and community; this is part of what I think about when I think about creativity in context. At one point, Paley asks her assistant teacher, Nisha, “Isn’t it a great feeling, to be tying together all the stories” (1998:47). Nisha, who is of Indian heritage and grew up listening to many stories from the Hindu tradition, responds, “Yes, but it doesn't feel as if I'm tying things up. It's more like opening up, or maybe discovering things I've forgotten” (ibid). This would also be the spirit of play in a certain context, that is, of a group that is passionately seeking to understand hidden identities about the people and of themselves (or ourselves).

Paley also states, “I resist the uninvented classroom... The classroom needs to be invented as we go. I need the intense preoccupation of a group of children and teachers inventing new worlds as they learn to know each other's dreams” (1998:50). Again, I start to wonder what it would be like to have a course for adults with that same spirit. If we had that spirit, I think we would have a spirit of play, given that you could not rely on certainty or knowing what your role is. Nor would you know exactly what the teacher expected, because the teacher is working it out as well. Indeed, is intensely preoccupied in working it out.

What is not obvious at first in Paley's book is that she is trying to work out something for herself. We'll get to what I think she's trying to work out. First, a quote that has stayed with me for years: “play is narrative continuity” (1998:74). She goes on, “what school usually does is to
interrupt any attempt on the part of children to recapture the highly focused intensity of play” (1998:75). School is about interrupting the continuity that happens in play. Narrative continuity is like when someone is playing, for example, a little kid I saw in the waiting room recently. He is moving trucks and then one truck gets another truck on top, one on top of each other. In his mind, he has a story he is telling. There is some reason why one truck has been put on top of the other. When children are playing together, someone comes in with a slightly different story, and they manage to redirect the story so it includes the others (give or take squabbles at times).

Vivian Paley gradually articulates the problem that she is trying to work out during that year: “What's going to happen when I no longer hear the name teacher? Will I be left with no name at all?” (1998:89). What will be her identity when she retires? Maybe she could have worked on that by herself, but certainly, in the way she built her classroom community, she was one participant in “seeking hidden identities.”

This becomes clear when she writes about one of the students, Walter (the anglicized version of his name, Wladyslaw), who can read and write Polish, but for whom English is new. The children all write stories which are then read aloud. In the stories, chapters are very important. One story by Reeny, I think ended, “To be Continued..” so Walter picked up on this in his. “Story of Chapters.” “Once a time, Chapter is One, And the End is Coming, Until the Cock Crows, To Be Continued, Haha.” Vivian Paley finds her voice in this story and solves her problem of retiring. The last line of the book, “Don't fly away. See we can keep talking about it, okay?” (Paley 1998:99).

* * *

At this point let us pause and spend a four-five minutes free writing to identify critical thinking principles for design in relationship to play. You might look back to the critical thinking principles that I suggested for this session in the first paragraph. You can also review the videos and think about other things that might have come up for you, or may come up for you as you free write. Again, free writing is writing without taking your pen off the paper. If you cannot think of anything, usually writing “blah, blah, blah” until something emerges. I encourage readers to break and do the free writing before moving ahead.

Free writing led me to identify a critical thinking principle that is relevant to extending play in children the topic of the case for the class as follows: the word “play” is ambiguous and rich. In this session, we focused on play in the sense of prototyping, modeling and tinkering: laying it out in advance and planning before we implement it. We also thought about doing these
tasks playfully. Using the computer clubhouse as a model, we can see that play in a larger sense is connected with the other three Ps: projects, passion, and peers. If we are frustrated, if we are stuck, if something is not working, if we are not coming up with something, then it is not just a matter of saying, “You just need to tinker more; you just need to play.” My critical thinking theme was that you need to bring in the whole 4 Ps to engage with Peers who connect with your Passion, help you to change the Project, or recognize connections to other’s projects. Maybe you can work with them until you are clear about your project. Suppose we extend Peers to also include mentors and mentors of mentors, and then we flip it over to say that the young people in Paley’s kindergarten class—the girl with the brown crayon, and Walter/Wladyslaw—could also be teachers. They could be the people that Vivian Paley needed in her community and in her environment in order to keep working with passion and intensity until she understood her puzzle and could come to some resolution and identify what her project was in the last year of teaching.

References


Session Three
Gathering into Community

The initial critical thinking theme for this session, which we will add to as we go along, is that putting people into place as designers, users, or co-designer/users, may happen by working with what you know about people, by facilitating the arrangements, or by working around their constraints, at least temporarily.

This session involves many different pieces, but unlike the previous sessions, not many videos. The first item is Scratch, one of the activities mentioned in last session’s video of The Computer Clubhouse (Lifelong Kindergarten 2014). Scratch is a particular form of software designed at the Media Lab at MIT that allows for sharing, collaboration, and building upon other people’s projects. The Scratch project of mine (Figure 1) is based on a previous project by someone else, evident in the title and notes. I also give credit to Martin Dylan for advice.

Figure 1: This is a screen capture of the Scratch project I did early in 2013 as part of the Learning Creative Learning course that the Lifelong Kindergarten were running from the Media Lab at MIT. https://scratch.mit.edu/projects/20140035/

In the MediaLab’s course, Learning Creative Learning, one of the recommended activities was to visit a creative learning space in our local area and interview the people there. In some ways we had a similar interview in one of the videos from the last session when Mitch Resnick and Natalie Rusk went to the Computer Clubhouse at the Museum of Science (Lifelong
Then we saw more or less the kind of questions that they asked, and we could also follow these questions in other areas that we know locally. These questions cannot be answered in the abstract in advance. You would have to go and visit. We could learn a lot about the people who have come there, their diversity, where their ideas come from, where they come from, how they help each other, the role of mentors, their trajectories or the life course of people’s involvement, and how people treat each other. And we could also ask what aspects and materials of the physical space are available. The clubhouses have many high tech computer and software firms behind them. The Computer Clubhouse video from the last session does not mention how the people have managed to pull together the funding—funding that is not always available to every community project.

This point leads me to Luanne Witkowski’s approach, which she calls “basic training,” or “(W)holistic Sustainable Studio/Life Experience.” (Witkowski 2003). Luanne is a local artist in Boston, who works as a studio manager at MassArt to make a living. An “anti-picture” for Luanne is a painting where a man sits in his bedroom with large unfinished paintings propped up between his desk and bed. While the man is painting, there are also open containers of chemicals haphazardly placed in the room where he sleeps. In basic training in contrast, there are three responsibilities of artists (Figure 2).

![THREE Responsibilities of Artists](http://crcrth611sui.wikispaces.umb.edu/file/view/692LWpresentation.pdf)
The first is personal. One of the ways to stay healthy is to not bring toxic chemicals into your bedroom. The second is environmental. For example, do not flush chemicals down the drain. Think about the consequences of chemical use when choosing materials. The third responsibility, to the community, is most interesting. Community responsibility is really saying that if you want to produce art, you also have to produce the community that is going to support your art, to be interested in it. For a number of years she had a chance to run a shop front gallery, Ekfa. If people wanted to exhibit in it they had to get involved with her in learning how to do everything—the advertising, the opening, the running of it, the display, the selection. She was not going to do it for them. So these three responsibilities of artists—to themselves, to the environment, and the community—informs all her work. (On her website you can also see some other links that describe more about what she has written about this; Witkowski n.d.)

Let me mention next The Planned Lifetime Advocacy Network. The basic idea is described in a New York Times opinion piece (Bornstein 2013). Ted Kuntz was thinking about how to look after his son, who twenty-eight and having severe cognitive disabilities, required continual care. It had been quite a stressful experience to raise this child. He and his wife were committed to raising the young adult, but also concerned about what would happen when they were gone. Based in British Columbia, they managed to connect with the Planned Lifetime Advocacy Network (n.d.), which helps people secure futures for family members with disabilities. It would be interesting to find out how wide these kinds of networks are established in North America and other parts of the world.

Unless a network has been set up for you, if you are trying to respond to emerging problems, then the community has to get together. One of the ways of doing that is called Strategic Participatory Planning. A Strategic Participatory Planning activity I got to know something about involved the West Nipissing region in Northern Ontario, about 300 kilometers North of Toronto. In the 1990’s the region was strained economically; employment opportunities were low and young people were leaving. The economic development body of that area got together and drew in some very skillful facilitators from the Institute of Cultural Affairs (ICA) in Toronto. (ICA is all over the world, and these days we would call cultural affairs “civil society.”) ICA staff are very good at facilitating. Figure 3 is from one part of a multi stage process of bringing together different representatives of the community. First, they try to get the group to imagine the future; then try to think about the obstacles and how to get to that future. Finally, they think about how to get around those obstacles and turn it into specific action plans.
When you bring together a group of people is that many different elements come up from the facilitated brainstorming. In Figure 3 these are grouped together into different categories, and then those are grouped together into larger categories. This is a multi-dimensional vision. One of the principles of the ICA approach is that if you facilitate for planning well with a diverse group of people, you will end up with something no one individual or no one specialized group could have come up with by themselves. Although not evident in this particular vision, in a similar regional planning, everyone expected that building a second paper mill was needed in order to boost employment. However, by the end of the strategic participatory planning, the proposed paper mill and its environmental effects was replaced with other ways of imagining an enriching economic future. Equally important in the many different action plans arising from this Strategic Participatory Planning in West Nipissing, many people were involved. In no time, you had

![Figure 3: Strategic Participatory Plan of West Nipissing](http://www.faculty.umb.edu/pjt/files/StrPartPlanChart.jpg)
people involved who did not even know there had been a strategic participatory planning activity. They completed enough of the activities that they did a second run some years later.

There are other things that shape a community besides Strategic Participatory Planning. In the early 2000s, the largest employer in the West Nipissing region, Weyerhaeuser, decided to close down the paper mill. The community got involved to try to prevent that, but they did not succeed. This approach does not solve every problem, nor can it confront every powerful aspect that shape people’s lives, but it was still very valuable for what it was able to do.

A similar kind of moral action comes up when we look at the Lucas Aerospace Plan (Doyle 1988). This was a plan created in England in the late 1970’s when Lucas Aerospace, a military contractor, was going to downsize. The workers at Lucas Aerospace—the engineers, the people who work machines, and the people who did clerical work—got together and created a plan for alternative employment using the same skill set and the same equipment. Doyle describes some of the things the company was known for doing—building torpedoes and so on. Lucas Aerospace did not accept the plan from their workers, in effect saying “we are running this place,” but the workers got involved with technical universities and technical institutes and created many new technologies. In particular, one engineer made the Hobcart for children with Spina bifida, to move around by their own energy (Dixon 1975). (See also session 4 on enabling.) When I was living in England around 1980, I heard a radio interview with an engineer about being involved in this. The skills he had spent his life using to help build better more accurate missiles guidance systems could, he now realized, be used to help design something that would create the joy he saw when a child was able to move and not be immobilized in their wheelchair.

On the topic of defense, many people would be skeptical of communities getting together to defend themselves. After all, intercontinental-ballistic missiles can come from anywhere. Brian Martin said, in effect, “let us look at Australia; it has an enormous coastline. How can any military defend such a coastline from invasion? Let us look at what happens if we actually build up a civil defense” (Martin 1999). As he worked with people to think about what would be involved in designing civil defense, he knew that the government was not going to implement the procedures he developed; the government was going to spend millions of dollars on a single aircraft carrier.

On another track, if we think about gathering people into community, we are often thinking about working together in groups or creating a community that can work together. Two
of the themes or perspectives that I have developed, organizing and running workshops, are given in two schemas (Figure 4 and 5).

![Figure 4: The Four R's: Respect, Risk, Revelation, Re-engagement](https://pcrcr.files.wordpress.com/2013/12/learningobjectives4rsctm1.jpg)

With the Four Rs—Respect, Risk, Revelation, Re-engagement—there is an arrow, a direction. The idea is that when a group working together puts energy at the beginning into people coming to respect the other participants and respect themselves, if they invest in that first, they are more likely to take risks—to get involved in new activities, to try new directions, to get involved in something where they are not sure of whether it will succeed or how it will develop. Out of taking risks to work with people who are different from them, they are more likely to have new insights or revelations. The experience of having new insights about themselves and about the world and possibilities is often a basis of getting engaged or re-engaged to do something.

Those Four Rs inform the way I think about organizing or initiating any group activity. For example, what would you do to build up respect for other people and for yourselves? As a leader you would not spend much time at the beginning explaining to people all your ideas, but give them a chance to bring their own ideas to the surface and share them in some way. A freewriting activity—we have already done freewriting in previous sessions—addressing what people are bringing to the workshop and what they are hoping to get from it would be one of the very earliest activities. The next step is to share that with another person so they have it heard and so they hear from someone who is different from themself. Next I would spend quite a long period of time in which people took turns to tell their story and about how they came to be someone who would be interested to join in the workshop (whatever the workshop is). In this way, they have given respect to themselves as they listen to themselves telling their stories. They
are also finding commonalities that they did not see when they first saw a person across the room. They see that there are hidden diversities, as well as hidden connections. Now you may want people to be engaged at the end in some plan that will be carried out, some action, or some organization. The Four Rs are saying do not go directly there; go indirectly there. Take the time to build a basis of respect at the beginning and move through these other steps (Taylor and Szteiter 2012).

The second schema arose about fifteen years ago when, having gone to four interdisciplinary environmental workshops, I was trying to think about my experience and decipher why most of them did not work very well. In thinking about what makes a workshop successful, I articulated themes (or principles or guidelines) in a talk. A colleague offered to help me make sense of this. The first steps were to define what I meant by successful workshop, and abbreviate my list of guidelines to ten or twenty. We worked together using some software he had. At the end it produced a diagram something like Figure 5.

![Figure 5: Structural model of Criteria and Conditions for a Successful Workshop](http://www.faculty.umb.edu/pjt/files/ECOS.jpg)
We were able to organize the different guidelines into conditions conducive of success and develop aspects we called the “deep drivers,”—those which make other conditions more likely. It turns out the one at the bottom, the deepest driver was “quiet spaces that occur are not filled up.” If you are not able to do that—if you are so busy, there is too much of an agenda, or someone jumps in as soon as there is silence—you are not allowing people enough time to make notes, reflect, go for walks, and digest to what is happening. If that is missing, you are less likely to have the next level: “participants gain insight into their present place and direction by hearing what they happen to mention and omit in telling their own stories.” You are also less likely to have the other condition: “hearing of others leads participants to examine decisions made in advance about what the other people are like, what they are and are not capable of” and so on.

This process was done before we came up with the Four Rs, but you can definitely see the resonance here.

When we talk about gathering people into community, it is not a simple thing of advertising the meeting and then using Robert’s Rules of Orders. In the West Nipissing example of the Strategic Participatory Planning, I mentioned that not everything works out the way participants would like. Multi-national paper companies can close a factory and move their plant somewhere else, leaving behind unemployed people—you can not replace that many jobs quickly. If we are thinking about gathering people into community maybe we would benefit from having some ideals—what world we like to live in—that takes us beyond the hard work of doing the basic training creating these lifetime advocacy networks, doing the work we need to support the child or the adult, even with the help of the network. The hard work of bringing people together and carrying people through the participatory planning, the political labor struggle that went on to try to get Lucas Aerospace to implement the plan, and so on.

The last item in this presentation then is Woody Guthrie’s 1948 lyrics “Heaven.” The Klezmatics wrote the music sung in the recording of Murphy (2009).

…I walk through the sunshiny factory where dresses and shirts are both clean;
A brother and sister are singing at work as they watch all the wheels;
No smudge clouds of smoke hide my valley, my sky it is clear for miles;
The mountains are all dancing happy, the trees are waving me smiles…
Every hand works in hand with the other and not for power nor greed;
Every hand works to its fullest ability and is paid in its deepest of need;
No cancer, no tuberculosis, no paralysis nor asylums are here
No bowery nor skid row of homeless, no eye that is blinded by tears. 
(https://www.woodyguthrie.org/Lyrics/Heaven.htm)

This is a dream. Woody Guthrie is not thinking there is anything simple about creating this future. We need to gather into community to make the best effort we can. Yet, as I stated before, having our ideal in mind can help us as we deal with difficult problems. That is what the case for this third session is about: learning from experiences in the past and elsewhere to prepare one’s community for epidemics that may or may not happen. Epidemics can be quite serious. The 1918 flu pandemic killed an enormous number, far more millions than were killed in the 1914-18 war. Preparing the community is, in effect, saying that you do not simply wait for a crisis then respond to it; you prepare. (The community here might be your neighborhood, but it could also be your profession, your workplace, your ethnic group, or your political group.)

Some items that might help warm up reader’s thinking: The photo below from the 1918 pandemic or the audio recording (Bartley n.d.) could prompt you to consider the fate of orphans—if so many people were killed in the flu pandemic there must have been a lot of orphans. The Ebola outbreak in the middle of 2014 in West Africa (Wallace 2014a) seems to connect climate change and disease (Wallace 2014b). The Cuban Emergency Response System is a very positive example of community preparation (Wikipedia n.d.a). Although it is not about epidemics, “Lifeboat Ethics” is an anti-example for me (Wikipedia n.d.b). Some student course activities (Taylor 2011, Maurer 2012), like this case, are about improving responses to extreme climatic events.

![Figure 6. Mass hospitalization at US naval center in Dartmouth during the 1918 flu epidemic.](https://discardstudies.files.wordpress.com/2013/06/32774286.jpg; Original source unknown)
References


Session Four
Enabling

The initial critical thinking theme is that all disabilities can be reframed as opportunities in two ways: first, to enable others and second, to enable those who are differently abled. In this course, critical thinking is understanding an idea or a practice by examining it in relation to alternatives. In design, instead of thinking about disabilities as a problem of people who are disabled, we are reframing them as opportunities to enable others and to learn from those who are differently abled.

Figure 1: The Tiger and Turtle Magic Mountain in Duisburg, Germany, image from: http://media.treehugger.com/assets/images/2011/11/landmarke-bilder7-gr.jpeg

Figure 1 is an image of people being differently abled, using a walkable rollercoaster in Germany. It is designed for people who get sick to the stomach when they go on a normal roller coaster. Here you can walk at your own pace. (What I do not know, and the person who posted this picture did not know, is how you do that big loop that seems to go upside down.) I would love to go on a walkable roller coaster. My days of enjoying a rollercoaster have passed, so I have now moved into the category of being “disabled” with respect to being able to go on a rollercoaster.
A well-known approach to enabling is *universal design*—to build something so everyone can make good use of it. It is not only to build a ramp so people with wheelchairs can get into a building, but to also think about the different ways that all sorts of different abilities can be catered to. This idea is particularly strong in education. The National Center on Universal Design for Learning provides a video, “UDL at a Glance,” that highlights three principles of the project (CAST 2010). It is a promotional video, and you would have to explore the site more to decide for yourself how those principles get put into practice, how well they do, how difficult it is to do, and the difference between being able to talk the talk of universal design and walking the talk.

Bliss Symbolics is an ideal practice that surpasses the previous examples discussed. The online podcast, Radio Lab, discusses the originator of this ideal communication system, Charles Bliss, in the episode, “Bliss” (2013). (Originally his name was Mr. Blitz, but during the war he decided it was not good to be called “Blitz” while he was in England during the German blitzkrieg, or “war storm.”) Bliss spent time in China before ending up in Australia. He set as his mission to develop a language that would prevent people from misunderstanding each other, or having different interpretations of what was being said. It was a pictorial language clearly inspired by his time in China. He spent a long time developing it, publishing it in books and promoting it.

It was not until the late 1960s and early 70s that Bliss Symbolics was picked up in Canada by people who worked with children with Cerebral Palsy who had difficulty controlling their limbs and arms. The children were thrilled to have a way of communicating. A modern day version used by adults is derived from Bliss Symbolics (LiberatorAust 2009). If you listen the Radio Lab (2013) podcast, you will see how the ideals of Bliss diverged from the way it was implemented enough so that hBliss started suing the people in Canada. That part of the story is sad, but I do not think his life is so sad when you watch just how quickly these people are able to communicate with the symbolic language.

The Davis (2013) essay on disabilities studies takes us even further than simply learning from those who are differently abled. It critiques many of our intellectual frameworks from the point of view of the deep assumptions of normality that are built in and of periods in our history that have not always had such a deep assumption of “normality.” An interesting point to note is that the essay by Davis is the introduction to the fourth volume of a collection, *Disability Studies*, which had gone through four editions in fifteen years. Davis summarizes the changes that have taken place during that time in this field of study. In the first edition disability studies
lacked traction and was not getting attention. In the second edition he saw disabilities studies on the rise. In the third edition Davis posited that disabilities studies is definitely part of the academic world and civil society. And in the fourth edition, disability studies is not only accepted, but has also become very much a critical term in discussions of being, post humanism, political theory, transgender theory, philosophy, and the like. This is a very rapid rise of a framework that is trying to get us to not see disability as deviations from the norm that is often the main focus of social sciences, humanities, and so on. Instead, the perspective of coming from the edge of the normal range gives you deeper perspectives on what is going on. It is a necessary perspective, not just something we can learn from.

As with previous sessions, students spend four minutes freewriting at this point on this inversion, on seeing the world from the point of view of what we used to call “disabled.” An example or simple analogy might be to imagine yourself in a concert hall or a theater at intermission. There are long lines outside the women’s bathrooms, but not outside the men’s bathrooms. Coming from that simple perspective, you might say an architect would learn to have a bigger space and more stalls in the women’s bathrooms and a smaller area for the men’s bathrooms. There may be some theaters that have that now, but many do not. This example is not to say that being a female is being disabled, but that looking at design from the perspective of the range of abilities can lead to changes that make things better for people. While in a text we cannot hear back about individual freewriting responses, I hope that readers will keep inversion in mind as they think about the remaining examples in this session.

The next few examples are focused on enabling from the point of view of technologies and the contrast between “high tech” and “low tech.” The first example, the video “What is Tek RMD” (Tek RMC 2011), shows an interesting piece of enabling technology. Different from conventional wheelchairs, it allows for the user to move vertically as well as horizontally. I am very impressed about the design thinking that went into it. If you watch the complete video and follow the links, you will learn that, although it costs several tens of thousands of dollars, it has enormous benefits in preventing many of the health problems that come from being confined to a wheelchair all day or being confined to a bed, if that is the case. It provides people with up and down exercise and allows people to move to different levels at different times and different situations. Socially, not just health-wise, being able to come up to the level of a table where a variety of people are all sitting around having refreshments is very important for people. It
avoids being looked down on and treated like a young child, as often happens to people confined and placed lower down in wheelchairs.

In the last session, on gathering into community, I mentioned the Lucas Aerospace alternative plan and the Hobcart the engineers designed for children with Spina Bifida.

![Hobcart](image)

**Figure 2: The Hobcart. Image and text insert from the article “Aerospace Workers: into the dole queue or useful projects?” (Dixon 1975).**

This picture comes from an article describing how workers and trade union members at Lucas Aerospace attempted to address government financial cuts to the military and potential factory closures through the “redemption of [their] skills into alternative projects that are both socially useful and profitable” (Dixon 1975).

A “low tech” approach to prosthetics is represented in the next example. In this case the aim is to develop a lower leg prosthetic with production costs less than $50. This addresses the increasing rate of amputations, which include injuries from mines, as well as a rise of diabetes in the developing world.

![Low-tech prosthetics](image)

**Figure 3: Example of low-tech/low-cost prosthetics. Source: http://www.lowcostprosthesis.org/**
Contrast that with the mind-controlled prosthetic arms developed by the Advanced Physics Lab at Johns Hopkins University (JHU Applied Physics Laboratory 2014). It is impressive to see a man who has lacked arms for 40 years be able to control the many degrees of freedom of his prosthetic arms and manipulate objects. Obviously more expensive than the $50 for the low cost prosthetics or another low-cost example from China described in New Tang Dynasty Television (2013). How much, we might wonder, are the “high tech” engineers paying attention to “low tech” solutions, such as what the person was able to do in China.

The next examples of enabling concern organizational approaches to how people come together to support people with different abilities. The Human Givens approach to psychiatric care recognizes basic human needs—those are the “givens”—and works to develop short-term solutions, requiring participants to draw on their strengths to overcome problems (Human Givens Institute n.d.). It involves visualizations to try to undo the harm that has caused psychological problems. This approach originated in England and while it is very popular there, it has yet to take hold in the United States.

Feel free to read more about Human Givens to make your own assessment, but one essay that struck me concerns a facility that brings in behaviorally disturbed or disturbing children, and works with them in ways that enable them to be able to be integrated into the family life and in the community. What comes in to my questioning is how the people who set up this facility inspired by Human Givens made their life choices and commitments and found their abilities to be able to stay with these young people who were definitely trying to make life difficult for them (Grist and Beard 2006).

The next example, mentioned in the previous session, is The Planned Lifetime Advocacy Network. This network makes room and accommodations for families when the parents have been devoting a lot of time, energy, and resources to looking after their disabled children but are now growing older. As their children grow into adulthood, parents imagine their children will outlive them and the network provides a system of support (Bornstein 2013). It is really working to make new social possibilities. In the old days, such children would have been institutionalized and the state would look after them, sometimes in very abusive settings.

The last case for this session on enabling is the town of Geel in Belgium, which integrates the mentally ill into family and community life (Jay 2014). This town is well known for foster care and boarding. In Geel there is acceptance that the mentally ill can be part of the community. They are not just hidden away as problems for individual families to tackle. Other
people in the community are prepared to help or accommodate, and some have experience in knowing how to react well. What they do comes from a long tradition of many centuries of pilgrimages in which the mentally ill would come to Geel for healing.

As a final component to this session, let us look at the prompt for a design sketch. The exercise is to focus on enabling the elderly, inspired by the model of Geel in Belgium, by ADA-mandated accommodations for the disabled, and also by the intergenerational mentoring project that was developed by the American Association of Retired Persons and Mentor Up (IDEO 2014). Or, maybe you have been inspired in some ways by the technical measures referenced in the middle of this session. This design sketch invites you to consider what it would look like for a community to integrate the elderly into community life and enable their full participation.

Remember to address how to make the transition from where we are now to enabling the integration of the elderly into community life. How would that shift be organized?

References


Session Five
Design Thinking Education

The critical thinking theme of this session is to make design thinking available to all, asking students, or collaborators, to imagine that you do not say, “It’s not my problem”, or, “This seems too hard for me to solve.” Imagine instead, that whatever your age or background, you can rise to the challenge and contribute through a series of steps to a prototype to be tested in the real world. Instead of the position, “It’s not my problem,” or “This is too hard for me to solve,” the alternative is to imagine you could be involved in designing solutions to problems.

Michael Schwab describes how he worked with third graders to solve the problem about waste in school lunches (1989). You might say, “Adults can see what is going on; they should be able to work it out.” But when he involved third graders in solving the problem, they learned that, for example, the milk, which was supposed to be fresh each day, was actually a day or so old—the contractor was skimping. The third graders knew this because they would find the milk sour and leave it unfinished thus creating waste in the school lunches. If they finished lunch early, they got more time to play outside. This example illustrates no matter your age or background you can analyze the problem and work out the solutions. (Of course, someone with authority has to get the contractor for the school meals to do their job responsibly, and the school principal to rethink the allocation of time for play.)

Co Barry’s short talk on design thinking education (TEDx Talk 2013) identifies design thinking as a process for developing the skills and tools to solve complex problems. Barry presents the work completed by students in an African Leadership Program as an example of design thinking education. A variety of students worked together to address long term health risks concerning skin cancer, assessing and identifying a series of lasting impacts for the community. Her organization, CREATEDU, implements design thinking in education, adopting design thinking from the Stanford D.School (we will see more about that later). The basic problem solving process is illustrated in this diagram.
CREATEDU’s process consists of learning about the audience—empathy—brainstorming, creating a prototype, testing with your original user group to see whether you have caught what they need, getting more ideas from them, and continuing to refine and focus your question based on your insights from the empathy and from the prototype. This is a back and forth process, and each task surrounding the five circles can be repeated. Lime Design (n.d) has a slightly different representation of this process (Figure 2). Innovation, involving exploration, developing empathy, ideation, deferring judgment,—coming up with as many ideas as possible without criticism, experimentation, learning from failure through by prototyping and refining the prototype.

Design thinking is spelled out further in a presentation made at the Santa Catalina School (2013). The presentation repeats the design process thinking terms, and it emphasizes building “a first generation of your darling idea quickly, roughly, to get feedback in mind.” (We will also see that in later sessions in “Lean Start Ups.”) The presentation includes something about the mindsets that inform this design thinking: “human centered” emphasizes empathy with the users, bias toward action, getting something done and solved, and radical collaboration. (Collaboration among people who are very different from each other is, I think, the radical part.) Mindful that it is a process, you should not expect to fast forward to the solution. Get people involved by showing them the work, not telling them. Not only trying to convince them that it will work, but let them get their hands on it and work with it in a culture of prototyping. When projects fail, failing becomes an asset.
In the Santa Catalina junior high school, students used the design process to identify their dilemma (or challenge) to make a class t-shirt in a democratic and efficient way. They went through the process of interviewing students and created a statement of what the class identity was. Students wanted to address how they would be seen in the future—what their legacy might be. The organization, Lime Design, helped them do the brainstorming, and develop a prototype. After some responses from their community, they come up with a new idea, which seems to capture the different aspects of their identity (Figure 3).
In design thinking, the idea that everyone can tackle problems and come up with design solutions is not without tensions. The level of skill brought into the problem, as well as the difficulty of the challenge, plays a role in the development of solutions. Figure 4 illustrates the tensions of variable skills and degrees of challenge.

Figure 3: Image of 2012 Class T-Shirt at Santa Catalina School, developed through design thinking. Available at https://dschool-old.stanford.edu/groups/k12/wiki/90fc8/CAIS_Presentation_on_Design_Thinking.html Accessed January 27, 2018.

Figure 4: Skill Diagram illustrated by Oliver Beatson. Available at: https://commons.wikimedia.org/wiki/File%3AChallenge_vs_skill.svg#metadata
There are two axes: a challenge level and a skill level. Apathy towards a problem results when your skills are low and there is not much challenge in the project. Anxiety develops if you have low skills, but the challenge is difficult. And, if the project is easy (“low challenge”), but you have a high skill level, you can relax because you can solve this problem. But “high skill” combined with “high challenge” is where you get the creative flow. In between you have got other aspects. “Control,” might mean highly skilled people without much challenge tend to control things or to worry. “Arousal” sounds interesting, or maybe it does not sound so great. In a way this is like a multi colored litmus paper. You can watch how a group of students is responding to the design challenge and diagnose where they are in this schema, perhaps helping them adjust to the level of challenge, or backtrack and develop the skills needed.

*   *   *

In design thinking there is an emphasis on prototyping, which is also called “tinkering.” In *The Art of Tinkering* (2013), Karen Wilkinson and Mike Petrich focus on materials. However, their ideas can be translated to many other issues about design that are brought up in Design for Living Complexities.

Wilkinson and Petrich identify many “Tenets of Tinkering,” including “head scratching” (in their words, “ideation, trial and error, aha moments”), “create rather than consume” (that is definitely a central part of design thinking), “revisit and iterate on your ideas” (that is in prototyping), and “prototype rapidly” (2013:14-15). “Embrace your tools” has not been emphasized so much in the schema on design thinking described earlier, but it can be emphasized above in Figure 3 concerning skill sets. For some complex problems and the construction of prototypes, you can imagine solutions better if you appreciate the tools available.

Wilkinson and Petrich continue: “you are comfortable not knowing, go ahead get stuck, reinvent old technology so you can come to understand how they work,” and “start to look around the world to see real world examples to see the design that has been involved” (2013:15). While the Santa Catalina School example above also used the term “radical collaboration,” the authors here suggest collaborating then pulling back to work on things you saw, which is more of a dynamic here. “Take your work seriously without taking yourself seriously” (ibid). In essence, what they are saying here is take yourself seriously and you could really be involved in helping generate a solution toward a problem, but do it by playing, being “messy, noisy, sometimes dangerous situations” (ibid). Here their emphasis is on making material things and these different
bits of equipment, which we also saw in the Computer Clubhouse in sessions two and three. Yet, tinkering is involved in designing, extending beyond designing material artifacts.

The final example of design thinking presented in this session is a video about David Kelley, the founder of the design firm IDEO (CBS News 2013). He created the Design School at Stanford, as well as the movement of design thinking in education. He worked with Steve Jobs at Apple; his firm continues to design products for a variety of corporations. Design thinking, he says, “is empathetic to people to try to really understand what they value.” It requires “a diverse group of people ... [that] build on each other’s ideas” (CBS News 2013). Kelly’s ideas are reflected in the examples we have explored earlier in this session.

As with previous sessions, students are encouraged to explore a preselected set of resources and come back to the session for discussion. Each resource should interest readers, take you to other links, and show you the range of ways people are working and building facilities where people can work together.

- The IDEO website presents a range of spheres about vocation, including human development and product development (IDEO n.d.).
- The Artisan Asylum is a place where communities make design thinking possible, and people to come together so that you do not have to do it in your own garage (Artisan Asylum n.d.).
- Design Thinking for Educators is a wiki resource for people trying to implement design thinking for school (Design Thinking for Educators n.d.).
- The MIT Media Labs course, Learning Creative Learning explored similar topics as well (Learning Creative Learning 2014).

After exploring these links, students and readers can focus on the case or design sketch for this session. Remember the design principle: we do not say it’s some else’s problem; it’s too hard for me to solve. For example, this was the idea of creating prosthetics or improvements for “normal” people in session four, “Enabling.” Examples include lactose free milk (for people who are lactose intolerant), eye glasses (which have been around for centuries), and shoes (we did not evolve off the savanna with shoes on). Let us work with that a bit further. What would be involved if bottle milk could be fed through nipples so that all men and women could breast feed? Or if the clothing of young people disrupted associations with one gender or the other, so that it was harder for the outside world to treat a young child in gendered ways? (I recall a story I
heard of a three or four year old coming home from a friend’s place, where the friend had a new baby sibling, and the parent asked, as adults do, “Was it a boy or a girl?” And the child stopped to think about it and then said, “I don’t know. It’s so hard to tell with their clothes off.”) Getting away from strictly material things, imagine a place to register problems in roadways and signage for rapid fixing rather than curse them and move on.

There are three steps to this design problem:
1. Warm up your thinking by brainstorming recent or longstanding frustrations you have had with your body or your surroundings, and then convert that into a possible prosthetics or improvement.
2. Choose one problem to be solved by a design team, and then spell out who might be drawn into your "dream team" of designers and how your design studio will operate.
3. Remember to identify critical thinking principles concerning design thinking and education.

We can imagine that whatever our age or background, we can rise to the challenge and contribute to a series of steps to a prototype to be tested in the real world.

**References**


Lime Design. n.d. *The design thinking & innovation process*. Chart


Session Six
Craft, Improvisation, Innovation and Uptake

Craft, improvisation, innovation and uptake must seem like a lot of themes. The idea that frames this session is that craft, improvisation, innovation and uptake are well managed learning. This emphasis may make us think about resistance to learning, how to manage resistance to learning, and the challenge of bringing people into a learning process.

The session begins by looking at conventional designers. The late David Pye, a furniture designer, was well known for his books on design including *The Nature of Design*, later published as *The Nature & Aesthetics of Design* (1964), and *The Nature and Art of Workmanship* (1968). He particularly worked with wood—both in furniture, carvings, and large carved bowls—but he ended up learning blacksmithing to build the tools he needed that were not easily available, and in some cases had not yet been invented. For example, he built a fluting engine with which he cut smooth rhythmic flutes on the inner surface of his bowls.

As stated in his obituary in *The Independent*, David Pye’s bowls (which you can find images of online), and his machines—essentially guided hand-tools—embody, in a way, the concerns of Pye’s writings and of his craftwork. Their purpose is to bring diversity to the object, changing and enlivening the quality of its surface, and offering the eye something to focus on intermediate in scale between the object’s large form and the minute texture of the wood itself. Pye invented a terminology for different kinds of workmanship:

- Workmanship of risk (which involves a constant risk of failure),
- Workmanship of certainty (as in much industrial production, where the process should guarantee the result),
- Free workmanship (avoiding precise reproduction of a design) and
- Highly regulated workmanship (precise reproduction) (Frost 1993, *bullet points added for clarity*).

Each of these kinds of workmanship involves learning. Pye presented six principles for thinking about workmanship, which is the craft component of the session’s overarching themes. While these principles are a little abstract, you can refer back to his books to understand
them well. Pye has a sense in his work that not all of design is good and that people need to work to unlearn habits before getting better. His Six Requirements of Design are:

1. It must correctly embody the essential principle of arrangement.
2. The components of the device must be geometrically related....
3. The components must be strong enough to transmit and resist forces as the intended result requires.
4. Access must be provided [as relates to 2, concerning the physical and the geometric arrangement]
5. The cost of the result must be acceptable....
6. The appearance must be acceptable... (Pye 1964)

The second and third principles are easy to forget in this world where many designers are focused on bringing a software app to market, not designing something with physical gears and levers.

The principles of David Pye focus on the craftsmen—and women—as well as workmanship. These develop more as we look at innovative and entrepreneurial culture as exemplified in the video “Products of the Ages” (Adam and Edwards 2013). The video reminds us of the evolution of the products, or the things we classically think about as design in the sense of style. Showing twelve images of twelve objects (one for each decade from 1900 to 2010), the video shows the evolution of these objects over successive decades. Included are newspapers telephones, prams (or strollers), one pound (from paper to coin currency), hearing aids, mannequins, milk containers, music formats, swimsuits, keyboards, jelly molds, and alarm clocks.

In these products, we see some of the themes of Pye. One theme is that functionalism—the idea that the form follows the function—is nonsense. In design, form and function work together. (In Pye’s Six Principles, this is geometric relatedness.) We also see another theme emphasized in the next session, namely, all invention is borrowing. Each stage in the evolution is built upon what has come before. When at some times there is a rupture—say, when you would go from milk in a glass bottle to milk in a cardboard pack—we have to then think about where this new view came from, where it is borrowed from. Pye’s book looks at many different technologies through the ages, showing you how they were borrowing from something which was familiar, even if it was used in a very different arena and amounted to a marked change.
Marked changes are what we call innovations. A key figure in the study of innovation is Everett Rogers. In the book *Diffusion of Innovations* (1962), he posits that different groups of people take up new technologies at different rates. Geoffrey Moore’s book *Crossing the Chasm* (2002) expands on Rogers’ theory as shown in Figure 1. Along the bottom axis are five categories of people. Whenever there is some episode of technological innovation (or bringing in a new technology to a community) people divide into these five categories. The ones who are producing innovation are close to people who are very interested to try out any new innovation. The majority of people have, however, a pragmatic view. The technology has to be workable for them in their situation. The late majority, the conservatives, and those that drag their feet greatly, the skeptics, make up the other categories.

![Technology Adoption Life Cycle: Diagnose and adapt as markets evolve](http://www.muckercapital.com/wp-content/uploads/2013/10/chasm.jpg)


Moore (2002) added additional themes to Roger’s theory: the bowling alley, the early market, the tornado, the main street, total assimilation, and most famously, the chasm, or the gap to be bridged between the early adopters and the pragmatists. In the video, “Geoffrey Moore - The Chasm Has Evolved” (MaRS Entrepreneurship Programs 2011), Moore describes this in great detail. In another video, “Crossing the Chasm in Consumer Markets: A Visual Example” Moore narrates events that begin with a lone dancer at a music festival, but eventually the chasm is crossed and we see a large group of people dancing (Moore 2012). There was, however, a long period where no one was picking up the product—the product being dancing to the music. The
lesson of Moore is to persist in the hope that you will be one of these cases where the chasm gets crossed, and “the tornado” takes off. “The bowling alley” is a place, as Moore describes, where some people can be drawn across.

The schema in Figure 2 shows an emphasis—moving from the left to the right—on action by innovators or by the early adopters against the resistance of pragmatists, the greater resistance of conservatives, and even greater resistance of skeptics. We could, however, say, in effect, pragmatists are pragmatic; they know a lot about their circumstances. Instead of focusing on the chasm that has to be crossed by someone with a new product, we could shift the attention to the interests of the pragmatists. This would entail not taking a product as an isolated thing and making it work in the situation, but paying attention to their situation with all of its complexities.

For example, if the product is a new piece of educational technology, you might spend a lot of time working with the teachers, some of whom are quite open to new technology, but they may also want to take it up when it fits in a larger scheme of commitments and obligations that have: parent teacher meetings, accountability, preparing for the test, documenting students’ work, tutoring students on the areas of the test when they are not doing so well, dealing with new principals, and so on. There could be a way in which, instead of pushing across the cartoon (Figure 2) from the left, we actually position ourselves in this “early majority” and look at the world from their point of view. The corresponding critical thinking in design principle, would say, “How does Moore’s view about crossing the chasm change if we take the vantage point, not of the innovator who wants to develop a market for their product, but of their majority of users who want innovations to be customized or connected to the complexities of their particular situations, which may vary from one person to the other?”

One way to think about this is the idea of “lean startups”—the ideal of lean startups (Ries 2011). The video “Learning: Exploit Collective Wisdom” (Lean Startup Co. 2014a), presents an example of a particular new product—a social search engine—to give a sense of the way in which a startup was involved in learning before they came up with this product. The startup developed a product called Aardvark by strategically developing and testing multiple prototypes until finding something that worked—even though it was not perfect from the beginning. They found a product that resonated with people and then built prototypes that filled user requirements and expectations. The video depicts people having a system of learning by prototyping and getting feedback, which is the basic idea of lean startups (2011).
Another sense in which the idea is an ideal is indicated in another video featured in the same conference for startups (Lean Startup Co. 2014b). The presenters use a lot of jargon, but they were walking the talk. Yet, it did not always work out. Members of a startup describe how they developed a plan for what they thought they needed to do—to maintain accountability by keeping track of spending—but as a consequence they lost sight of the overall user experience.

* * *

The overall idea of this session has been to connect craft, improvisation, innovation, and uptake, and see them all as well-managed learning. I would really like to have seen Pye working with his tools, and then adapting and inventing new tools, as well as teaching other people who have less skill, so you would see the craft that is required. We do not have videos of Pye in “well-managed learning,” but we have his principles, concepts, and some photos of the products he made. Some of the videos show how products have evolved over time; we can imagine the designers. The videos also illustrate how in the more recent business world there are two phases: the phase of emphasizing Rogers’ account of dispersion of innovation and Moore’s chasm to be crossed) and then a phase that focuses on intense feedback from users with very rough versions to start the process.

To finish this sixth session of the class, the design sketch pays attention to the idea of an apprenticeship—of not having the necessary skills to begin with, but working with someone who does—and combines that idea with session three, Gathering People into Communities. The case invites you to think of communities of practice, which is a larger and less formal idea than employees who are paid to work for a start up. Recall that the last session implied that everyone can be involved in design. That does not, however, mean that problems should be left to amateurs, or that everyone can be content remaining as an amateur in design. In this design sketch, map out pathways in which a person develops and refines skills in design and/or in critical thinking. This person might be yourself or someone you might teach or mentor. The pathways may involve apprenticeships, such as the Modern Apprenticeships program (Skills Development Scotland n.d.) communities of practice (Wikipedia n.d), and scaffolding (Great Schools Partnership n.d.). Scaffolding need not be restricted to its meaning in education (which is that a teacher starts with a final structure in minds and provides that students a reliable series of steps that they can use to get to understand the ideas and be proficient in the practices, but this can be a much broader idea of scaffolding, including family lineages as described by Packer (2010).
References


Session Seven
Standards, Conventions, Modularity and Infrastructure

The seventh theme—standards, conventions, modularity, and infrastructure—includes quite a mouthful of pieces, but I hope we see the connections, in particular the critical thinking in design theme for this session: “all invention is borrowing” (as David Pye furniture designer. who we met in session six remarked). The infrastructure already in place, standards, and use of modularity enable the designer to know the properties of borrowed materials and have some sense of the possibilities and the limits of adaptation into new arrangements. Indeed Pye’s dictum reminds us to build on what is already in place, and not assume that the new is better. We also saw in the lean startups of the last session the importance of building with feedback from users at an early stage.

Figure 1 is the first example, a detailed schema concerning material properties. In the different quadrants are listed materials from polymers to nanowires. On the axis is listed strength, elastic strain (and the limit of the elastic strain), and an elastic modulus (describing just how elastic a material is). Consider human hair and spider silk (in the green colored areas). (You are supposed to be able to look at these colored areas in the original graphic and work out where they are in the three-dimensional space. Sometimes with graphic conventions, we have to learn them before they work for us.) If we take spider silk on the front face on the left and move into this cube and we take spider silk on the top face and go down, and we take spider silk on the right face and go inward, and we can imagine where it is inside this cube. If you take human hair in comparison, you will see that it is not as strong. It almost has the same elastic strain—meaning it will snap if you pull it too far—but it definitely has less stretchiness than spider silk. That is why it is below spider silk in the bottom left.
Figure 1: “Find the Spot” Available at http://science.sciencemag.org/content/339/6124/1161.full

Once you start to get into this graphic you can see that there are a lot of physical properties to consider for specific materials. There are other ones not listed in Figure 1, such as conductivity. A craftsperson has to get to know these both by studying or reading manuals and by practice as David Pye was emphasizing in his work on using wood. In some senses, the material side of design has been downplayed a little in this course to try to allow design to be thought out broadly not to be thought of just as a tangible product. For example, there is also designing how to gather a community together.

The reading for this session by Matt Frederick (2007) is on architectural conventions. In it he looks at some of the 101 things he learned in architecture school. The first one is about lines:

How to draw a line: Architects use lines for different purposes, but the line type most specific to architecture is drawn with an emphasis at the beginning and at the end. This practice anchors a line to the page and gives a drawing conviction and punch. If your line trails off at the end, your drawings tend to look wimpy and vague (Frederick 2007:3).
The next lesson is about figure and ground. You can imagine that a figure is a geometric shape and the ground the space those shapes are in. Frederick also presents different ways that figures can be arranged to create different impressions. The same figures rearranged can produce the letter A, or something more abstract, for example. “Figure-ground theory states that the space that results from placing figures should be considered as carefully as a figures themselves” (Frederick 2007:7).

In some sense Frederick is telling us about design principles. We have to think more to work out how to stretch these principles to make them critical thinking in design principles—how to think about alternatives and how to understand his principles—the 101 things he learned—by considering them in relationship to alternatives. That is the spirit of critical thinking in this course. In another way he is telling us about conventions. If you want to do something in architecture you should build upon what other people have already done. It is not exactly standards, but once we get to designing—as an architect designs a building—we certainly have to pay attention to standards of materials. For example, a piece of precut lumber may be called by the dimension “4X1,” but actually, the real dimensions of the cut piece are smaller. So, as a designer you have to know what the actual dimensions are.

The next example, *Universal Principles of Design* (Lidwell et al. 2010) on graphic design conventions, is a complement to Frederick’s book. This book, which is beautiful as well as informative, is worth looking at to see and understand all its 125 principles. In the table of contents an alphabetical list of universal principles. One example is chunking, which is described as “a technique of combining many units of information into a limited number of units or chunks, so that the information is easier to process and remember” (Lidwell et al. 2010:40). This is more of a psychological technique. The example of chunking provided is in an e-learning course about engineering. One image or diagram is paired with a small amount of textual information. Successive pairs are divided on the page and students move through individual chunks of information before moving on in the course. This is a good way to convey information in e-learning courses.

A second example from Lidwell et al. is the expectation effect, or “a phenomenon in which perception and behavior changes as a result of personal expectations or the expectations of others” (2010:84). The authors go on to describe different versions of the effect. For example, the Hawthorne Effect is one in which “employees are more productive based on their belief that changes made to the environment will increase productivity” (ibid). The Pygmalion effect posits
“students perform better or worse based on the expectations of a teacher” (ibid). And the placebo effect states “patients experience treatment effects based on their belief that a treatment will work” (ibid).

While the authors illustrate the principles with graphic designs, these effects are more widespread in design than the authors imply. They state, “a credible presentation will generate an expectation effect in about 30 percent of any given audience. Keeping the claims and outcomes vague often helps—a believing person is biased to interpret ambiguous effects in accordance with their expectations. This technique was used to sell snake oil solutions” (Lidwell et al. 2010: 85). We often talk about snake oil and place the emphasis on the salesman. However, we do not talk about snake oil “expect-ese” with the emphasis is on the thirty percent of people who are expecting something to work.

When we talk about building upon conventions, we do have to allow for the fact that people tweak or shift the conventions. Figure 2 is a redesign of the Manhattan the New York City Subway by Max Roberts. Figure 3, for comparison, is the conventional map of the subway system produced by the Metropolitan Transit Authority.

We are all used to the subway or a map where Manhattan is a rectangle (Figure 3). What Figure 2 shows (though the use of the arcs) is that the subway lines radiate out from the middle of the bay. Roberts’ map has not been adopted yet. But you can see that: with a little bit of work you can shift your expectations of where things should be in a New York subway map. It conveys the information clearly and graphically; the image is less crowded than in the conventional Manhattan map. Note, however, that the classical map had a history and the various versions were also novel in their own time. That means two things: people had to learn how to read the earlier maps and they had to learn what the conventions were. Moreover, someone had to invent conventions that people could learn or someone would have had to have been interested in paying for the design and then print and take the risk that people would learn the conventions.

The next example shifts away from graphics to material construction and architecture. This concerns the legacy of the work of an Egyptian architect, Hassan Fathy. During World War II, he was recruited by the government to build a city, which became New Gourna. The intent was to move the people from the town of Old Gourna because the people in Old Gourna were making their living by raiding the historic tombs on the banks of the Nile.
Figure 2: “New York City Subway Lines” by Max Roberts. Available at https://www.fastcodesign.com/1673116/look-no-grid-nyc-reimagined-as-a-circular-metropolis
Fathy wanted to design the new town so that there would be new jobs there given that he was taking away people's previous livelihood (robbing the tombs). He wanted the city to be sustainable and its people not dependent on subsidies or even outside input of materials, such as concrete blocks for housing. He wanted the architecture to allow people to keep cool in the very...
hot summer and warm in the winter. He found some people further up the Nile in the Nubian region who could build arches with mud bricks and brought them down to New Gourna not only to build arches, but also to teach the local people how to do it. The next generation of people building arches would be the people in New Gourna. He also recognized that in that area a lot of people were getting sick from parasites that came in the water so he developed systems in the water canals that reduced the parasite levels.

The video, “Hassan Fathy’s New Gourna” (Wilkins 2011) shows some of these features. We see the fact that for all this clear thinking and integrated design that connected livelihood, health, and materials, not everything looks good 50 or 60 years later. You view the video and make your own judgments. One piece that is not explained in the video is that this project was undermined both by the government delaying the disbursement of the funds that were needed and by some of the strongest people in Old Gourna who wanted to hold on to their old livelihoods. In a way these groups colluded to prevent the project from coming to full fruition.

The next video “Design with Nature” (Khalili 2007) is about a person whose work is clearly inspired by Hassan Fathy the United States. Khalili describes the principles of earth architect for people who might not know design, through the concepts of arches, walls, domes, earth, water, air and fire. Examples in the video highlight how these basic principles can create structures that are resilient to a variety of natural disasters including earthquakes and floods.

The next example of architecture is a description. An architect in the Cambridge, Boston area, Brad Bellows, in the 1980s entered a competition from the Malaysian government for new housing in Kuala Lumpur. The city was growing rapidly and needed a way to house large numbers of people. At that time Brad was very interested in Chinese courtyard housing but soon realized that that would take up too much area to house people in that way. He started to think about issues of the social life that comes from people living around a courtyard, as well as the transitions that were happening to the extended family—the grandparents, the parents and the children starting to be a little bit less tight. He developed—and this is where modularity comes in—a building that has four vertical units around a central shaft. Each of those four units is made up of modules of 12 units in 3 floors. But of any four units in any one level, they step up one quarter of a floor from one to the next level. The result is a spiral up and every one of these four towers there’s a spiral up of four pieces. If you have an outdoor balcony on the very first unit of those 12 and then you step up to the next one and the next one, by the time you have gone round 12 units, that walkway is now the roof sheltering the upper floor of the unit below.
The idea in having those three levels or spiral levels is that the family could be integrated and enter from the central elevators at one place. But as decades went on and families were less integrated, the upper area could be what we in the United States would call a granny flat. You could enter in an upper level and have relative autonomy from the main area of the family. This outside walkway and balcony also presents the idea that instead of people taking the elevators and just coming out on floor going along the corridor and entering to their apartment, people could actually walk up and down around the outside. There would be a gradual walk, up a real spiral. You would walk up a set of steps to go between each quarter level up to the next quarter level up. Because the steps would not be as wide as the actual balcony there would be some dead space where you could have bushes. If you saw the picture of the design that Brad Bellows developed you would see a green building. Green buildings are much more common now—they are buildings with vines and plants growing all over the outside—but in the early 1980s this was novel and impressive.

What was important in Bellows’ design what that the modularity was not just the idea that the family could have eventually separated into different levels or be integrated into these parts of the unit. It was modular so that these could be built relatively inexpensively. What you also see, however, is an emphasis on community, which was sorely lacking by then in the housing projects—the high-rises that in some places are being pulled down now and replaced as being irredeemable. Bellow’s did not win the competition; the buildings have been built. However, the picture I depicted in words gives you a sense of how modularity can allow quite inspiring and cost-effective results.

The last example in this session is about infrastructure building. If we go back to the original themes: standards and modularity enable the designer to know the properties of borrowed materials and have some sense the possibilities and limits of adaptation to new arrangements. But the infrastructure already in place is also very important. So, we might ask, how does infrastructure get built?

To move away from the physical notion of infrastructure—the way we have power lines and water pipes (Huler 2010)—I want us to think about infrastructure in terms of people getting together, in particular patient advocacy groups. One of the most impressive patient advocacy groups is the National Down Syndrome Society in the US and internationally. Starting about thirty years ago some parents started to become more active concerning their children with Down Syndrome. These parents did not accept that their children might be sent away to an institution to
grow old or that their children should be kept away from society. Aided by the Americans with Disabilities Act, the parents started to advocate for their children to be brought into schools and more generally be brought out into society. As a consequence, more and more people became familiar with people with Down Syndrome and became comfortable with the range of social interactions that one can have with a person with Down Syndrome.

The National Down Syndrome Society website gives you a bigger picture of the work of patient advocates (NDSS n.d.). These days children born with Down Syndrome are quite likely to live to adulthood. There are a range of health problems; the patient advocacy groups and the parents advocating for the children are pushing for research to find not some magic genetic therapy, but to learn more about the kind of treatments that, say, will alleviate the effects of the heart defects which occur sometimes as part of Down Syndrome. They work very hard to bring the children into stimulating environments so they can develop their cognitive abilities. Now while there are some star young adults, there are some that definitely struggle. There is some tension among advocates given that society likes to display the stars, but there is also quite a bit of awareness among these affected and also their parents that the stars are special cases. The effort is to not make a parent feel bad if they did not bring up a child to be someone who was as high functioning as the stars. In short, in a very short time society has developed a markedly different attitude to Down Syndrome.

One of the things you will read if you dig into the Down Syndrome support work is that Down Syndrome is by far the most frequent anomaly that has a genetic basis. It is trisomy 21—those afflicted have three copies of number 21 chromosomes instead of two (NDSS n.d.). But it does not get the level of a research support that proportionate to that. You can also find that there are a lot of prenatal diagnosis of Down Syndrome, which justified in part by detecting Down Syndrome fetuses and offering the parents of choice of abortion. There are definitely tensions in this area. Is this fetus something to be aborted or is it something to be born and supported in multiple ways? Different parents make different decisions for different reasons. But one of the changes, which the National Down Syndrome Society and other support groups has made possible, is for people to see that a prenatal diagnosis of Down Syndrome isn't a zero compared to a one. That has been a major change.

* * *

As with previous sessions in the course, students are encouraged to explore a selected set of resources and bring back for discussion design sketches based in this session on the case,
“Borrowing.” Think of the Internet (which has made courses like this possible). It began over 20 years ago with researchers transferring files and messages, but it has since been borrowed—in particular for online shopping, for pornography, political campaigns, among other things, and so on. This case invites you to borrow the Internet further so that offices, classrooms, or the university can be retrofitted. So it is drawing you into the area of architecture—not rebuilding from scratch but respecting the infrastructure that is already in place. Preferably, any new aspects take into account existing conventions and the cost-savings that come with modularity. There is no need to confine yourself to retrofitting physical structures—you might borrow the Internet to retrofit what a class is.

References


Local particularity stands for a longer concept; the critical thinking design principles below are extensive. This theme is about an opposition between something local and particular and something that claims to apply generally (or be imposed from above to apply to everyone). Tip O’Neill, who was a long serving speaker of the House of Representatives in the United States, is credited with saying “all politics is local.” We can adapt that to “all design is local.” Ultimately, design has to work for particular people, using materials that can be made available in their particular setting.

To that end, you need to gather people into community, the theme of session three. In the context of this session’s theme, we can extend and think about how the knowledge of the people most affected by the given issue needs to be brought into play. Participation needs to be facilitated in ways that ensure that the full range of participants are invested in collaborating to bring the resulting design to fruition. (In contrast, most organizations’ strategic plans are not strategic and they are not plans. How so? The participants are not invested in collaborating to put the proposals into practice.

We can also extend the innovation and uptake theme of session six to this session (in essence, “don’t rely on early adopters of innovations, but pay attention to users—what Moore called the pragmatists—who, while prepared to adopt innovations, need innovations to be integrated with their own practical day-to-day concerns and specific situations (2014)). Paying attention and giving them voice, so as to not just see them as resisting the uptake of innovations created by creative people. Finally, acknowledging local distinctiveness, or the vernacular, is a way of demanding that the new keeps places worked and lived in, allows for diversity and non-conformity, maintains employment, and so on. We certainly do not just assume that the new is better.

The first reading describes the work of Remko Vonk and Louise Buck in an agroforestry scheme in Kenya in the 1980s (Taylor and Szteiter 2012). Their research found that most forestry plans led to the newly planted trees dying as soon as the project team left. Local people believed that the trees did not belong to them, so they did not care for the trees once the project organizers left. Vonk and Buck worked for an international aid group, Cooperative for American Relief Everywhere (CARE), who adopted an alternative strategy that led locals to consider newly
planted trees part of their own responsibility. That is the spirit that one hopes for from local participants in any venture, whether it is tree planting in Kenya, or anything else that we are designing, or being involved in designing.

In the 1970s, Ivan Illich wrote two landmark books. The first (and most famous), Deschooling Society (1971), described his radical ideas concerning education. He followed this with Tools for Conviviality (1973). Convivial technology was defined by contrast to mass production and industrial technology. In many walks of life

Our analysis of schooling has led us to recognize the mass production of education as a paradigm for other industrial enterprises, each producing a service commodity, each organized as a public utility, and each defining its output as a basic necessity. At first our attention was drawn to the compulsory insurance of professional health care, and to systems of public transport, which tend to become compulsory once traffic rolls above a certain speed (Illich 1973, xxii).

Illich asked how fast you really drive when you drive in a car in contrast to on a bicycle. With a bicycle you can easily keep up five miles per hour (eight kilometers per hour) on the old-fashioned bicycles—maybe three gears, not the thousand-dollar bicycles that we have today. He took that as a baseline and started to calculate a comparison for a car and a bicycle to travel. We can assume that the car is going forty miles per hour (or sixty-five kilometers per hour). That seems much faster than the five miles (eight kilometers per hour) for the bicycle. But then factor in the time spent to earn the money to pay for the car, the gasoline, the insurance, and the taxes that go into the roadways. Even before taking into account slower travel in traffic jams, traveling in a car comes out at the same speed as you were on a bicycle. This is shocking—when you are traveling in the car you think you are going much faster than on a bicycle. That little back-of-the-envelope calculation conveys the flavor of his thinking.

Continuing from the earlier quote, Illich states, “we found that the industrialization of any service agency leads to destructive side effects analogous to the unwanted secondary results well known from the overproduction of goods” (Illich 1973, xxii), or, recalling the theme of session one on destructive effects, not side-effects.

Ivan Illich was writing at a time—at the end of the 1960s and the early 70s—when there was, first, a concern about population growth and then, second, a concern about pollution from industrial production. (They are dominant themes today as we think about the effects of climate
change.) In the late 60s and 70s there was also the counter-culture movement in many countries, especially in the United States. The book *West of Eden: Communes and Utopia in Northern California* describes this particular moment (Boal et al. 2012). The editors and authors are not saying that Northern California was the only place where you have communes, but the projects focuses “on the extraordinary efflorescence of secular communal ventures initiated in the mid to late 1960s and flourishing into 1970s, across the Bay Area and its hinterland” (p. xiii). Many of those communes did not persist, but some did. That is not the point, nor the criterion for success. Instead, the authors claim that the legacy of Californian communes of that period permeates the wider culture in ways that are mostly unacknowledged, and invite documentation and analysis. The great communing experiment was a major thread in the development of the Left in the United States, and its aftermath can be detected in many facets of contemporary American life. For example, in food ways, in the protocols of group meetings and decision making, in sexual politics and child rearing, in the practices of civic life and local politics, in a very wide spread green sensibility, and a general valorization of community. Those themes certainly inform almost everyone who pushes for local particularity these days, forty years later.

Before moving on to examples to illustrate this last point, let me inject a possible critical thinking theme. The same underlying currents (or roots or bases) that were prevalent in the counter-culture have also given rise to entrepreneurs, star-making, and celebration of the possibilities of new technologies. They have not all gone towards communal, and community centered politics. Worden’s essay in *West of Eden*, conveys that very well. What do I mean by those basic currents? There is an opposition to the capital system, to structures and authority from above. There is a faith in what individuals can do. There is a fascination with new tools, whether it is the tools that allow you to put together a dome or, not long after, the personal computer. And there is interest in flexible organizations. Those same currents, we need to keep in mind, can, with libertarian and free-enterprise spirit, go in quite different ways from the communal spirit that the *West of Eden* editors and authors are promoting, and that is highlighted examples to come.

The first example is The Foodshed Movement. The name Foodshed is an analogy to watershed. Figure 1, an image of the New Mexico Foodshed, does not have normal municipal lines, but is instead divided into ecological regions. The red apple symbols are farmers markets, trying to indicate just how much food comes from the local food shed.
The website states,

A foodshed is a geographic area where vegetables and fruits, nuts and oils, meats and grains feed citizens within the region. Foodsheds make it easy to answer: Where this food might come from? (Dreaming New Mexico n.d.)
An implication here is, for most of us, it is very difficult to answer where our food comes from, let alone factor in the consequences of the ecological and the labor relations involved in producing that food.

To go from just mapping our foodsheds to doing something more than going to your farmer’s market and buying food—there are active and wide spread activist movements. One of them is Food Democracy Now. The organization describes itself as a “a grassroots community dedicated to building a sustainable food system that protects our natural environment, sustains farmers and nourishes families” (Food Democracy Now n.d.). While this mission statement does not emphasize local particularity, it does emphasize opposition to large-scale industrial farming, akin to Illich’s resistance to industrial enterprises.

In the United States, those kinds of movements have been built up by people becoming activists. However, in Cuba, change was forced upon the Cubans in 1991 by the collapse of Soviet Union, which lead to the collapse of the subsidy that came to Cuba in the way of cheaper oil, in particular, and also a market for their production. The documentary “The Power of Community: How Cuba Survived Peak Oil” conveys some of the adaptations the Cuban people had to make (Morgan 2006). In the clip selected for this session, Roberto Peréz (identified as a permaculturalist) describes how agricultural practices changed in the country as government owned agricultural lands were privatized and cooperatives were formed to address solutions and decision-making at the local level. The selection conveys some of the adaptations the Cuban people had to make. While Peréz sounds like an enthusiast for the government or the party, he is admitting there has been a shift from a top down hierarchical system to local autonomy. This documentary describes how the average weight of Cubans dropped about ten kilos, more than twenty pounds. In addition to farming, education and health services were also decentralized given that the centralized system requires transport to get to the hospital and so on. The average energy that the Cubans use for their way of life was an eighth of what it is in the United States. Peréz states that it would be interesting to try to assess what the standard of living is with an eighth of the amount of energy.

Cuba had no choice but to change. In various places in developed countries, people do have choices. Some are trying to steer the choices to making transitions, so that less energy is needed and less carbon dioxide is produced, while also maintaining a high standard of living. One effort is the Transition Towns Movement. The video, “Transition Town Totnes Wins Green
Award,” describes how the people of one town deliberately changed small everyday practices to significantly reduce the amount of energy the community used as a whole. In essence (and to paraphrase one of the phrases in the video), “What can we do to change my space here?” is a key line of inquiry.

How much can be done in such small spaces is evident in Permaculture, a movement that originated in Australia (Lawton 2013). Permaculture is permanent agriculture, so agriculturalists are not just plowing up every year and replanting crops. Instead, people plant trees and perennials, and though these are annuals to get vegetables. People who participate in Permaculture are particularly trying to create something that is in tune with the climate of the place, with the property lay out, and with the lot availability to be self-sufficient, diverse, and local. The Permaculture Movement, like the Transition Town Movement, is all over the world these days; you can find networks of commercial Permaculturalists, as well as many back-yard activists.

The video, “Urban Permaculture: The Micro Space,” shows how a permaculturalist turned his urban back yard into a productive garden (Lawton 2013). When you watch this video, what is particularly impressive is not just how much he produces, but how ordinary the setting is. It is in a suburb in Australia: all the houses are brick; there is a concrete driveway, and you go through a simple metal gate. Inside, however, there is a cornucopia.

Permaculture—by creating these intensely productive places in what had been conventional backyards—is reinventing something. The video “Slow Food Movement in Connecticut” (Bridgeport Now Live 2012), makes us think about the long history of ethnic gardening. Klindienst is quite a rare animal in writing about gardening and talking about politics. She is prepared to talk about its history of people being oppressed or dispossessed of their land. The stories in her book, The Earth Knows My Name: Food, Culture, and Sustainability in the Gardens of Ethnic Americans (2006), are beautifully written, I encourage you to read them. In the video Klindienst talks about how “for people that have been uprooted from their native cultures…. creating a garden and sustaining the foods that were passed down from generations of their ancestors is a way of holding on to some core sense of who they are as people” (Bridgeport Now Live 2012).

What we are seeing as we put together these examples is a tension between choice and necessity. The choice of deciding to become active in Transition Towns or Permaculture, or in a Food Democracy Now, or in valorizing ethnic gardening. The necessity of the people that
Klindienst is writing about, making changes because there is not a choice. The coercion in the past, of moving people away from their productive lands and settling them somewhere else—or leaving them to settle themselves.

There is clearly some room for political struggle and organizing. There is also an alternative, which is to try to hold on to the things we value without highlighting a struggle. We see this in efforts to emphasize what's distinctive about one's locality. For example, in England there is a project called Local Distinctiveness. In a talk about the project, Sue Clifford, argues “from the ecological towards people and locality” (Clifford 2010). She begins with a quote from D.H. Lawrence, *Sons and Lovers*:

They came near to the colliery. It stood quite still and black among the corn-fields, its immense heap of slag seen rising almost from the oats.

“What a pity there is a coal-pit here where it is so pretty!” said Clara.

“Do you think so?” he [Paul Morel] answered. “You see, I am so used to it I should miss it. ... I like the rows of trucks, and the headstocks, and the steam in the daytime, and the lights at night (Lawrence 1913:320).

In her talk she is trying to say that what is beautiful has to be about meaning. Places carry meanings that are significant to each of us given our own history. The task she sets out is to help people find shared meanings and act on them. Further in the text, she has a tourism poster with a slogan “Where on Earth?” The poster is about Bournemouth, a place in England, but as she points out that it could be anywhere on earth. There is nothing particular about Bournemouth in that poster and the same with this image of an urban street, which she calls “Anywhere Street” (Figure 2).
Clifford wants to get us to pay attention to the particular differences in each community: a bank of wildflowers that are characteristic in our region, specific artifacts—the tiling system, the roads there without curbs, even the particular chimney pots in Cambridge versus the ones in Kendall. Clifford is not arguing that everything has to stay the same. She is prepared, for example, to look at new developments in sculpture that connect the materials and the place and its history.

In her lecture, she presents a poster about Manchester (Figure 3). Many of these posters identify and organize distinct places, events, and people by going through the alphabet. What these are trying to do is to get you to know about many of the things that are of that locality. In the poster, you can see information for the Manchester Bee Keeper’s website, as well as Hyde’s Beer and Holt’s Beer. From this poster, you might ask, “What is Karl Marx’s connection with Manchester?” Well, it is through Friedrich Engels, his co-writer and collaborator. The poster says Engels brought Marx to Manchester in July 1845, but he did more than that. He brought their conversations and Marx’s writings. He brought Marx to pay attention to the conditions of the rising working class in England. I see in this movement for local distinctiveness greater attention to the ecological relations than there are to the labor relations, but it is possible to think about both.
Figure 3: This detail from the poster “Manchester in Particular,” is part of the larger project developed by Common Ground, Local Distinctiveness, “to inspire people and communities to protect and promote whatever is distinctive about a place” (https://www.commonground.org.uk/local-distinctiveness/). Image from the transcript. Clifford, Sue. 2010. “Beauty and Meaning.” RIBA Research Symposium: “Does Beauty Matter?”

The video, “Slow Foods” (National Geographic n.d.), tells the story of Salvatore, a chef who left the fast lane behind to open a restaurant focused on the Slow Food Movement, which he describes as “taking the time, finding the rhythm that lets you live more calmly, and in a lot of ways, starting of course with what you eat” (National Geographic n.d.). We do not know from the video much more about his history than that he ran a burger restaurant; it was possible that he was able to move and open the restaurant because he had accumulated enough profits to do that. There is always, in any movement focusing on the local, a tension that can be explored between the conditions in that place, and what is needed to sustain that place, which is often inputs from outside. Some of those inputs are the tourists who come to that region, bringing money that they earned in large urban areas across the world. The publicity for the tourism can now spread internationally, even as the people in the region are trying to preserve old local recipes for the wines and the cheeses, and so on.

If we are in the critical thinking spirit of looking at something by holding it in tension with alternatives, I think the next example is quite interesting. Google is going to allow you to personalize your maps. Google already personalizes your searches. It knows where you are, so it highlights things that are local to you—and it also highlights your own work, so it allows you to
be a bit narcissistic. In the essay “My Map or Yours?” Evgeny Morozov is asking whether having personalized maps is promoting diversity—each of us has different interests—or whether it is suppressing diversity by being specific to our own interests (2013). Do personalized maps prevent us from seeing new interests we could explore? Walking along the street, we could find a restaurant to go into, rather than have one chosen for us by Google Maps.

We may have an idea about what local particularity we want to conserve (or to restore, hold onto, to invest in), but that requires us to think about how we do that. How do we hold on to it? I have already mentioned the political dimensions: how deeply do you have to get involved in politics to hold back against the kinds of developments that undermine the local particularity that you might value.

Consider a quote from Myles Horton, the founder of the Highlander Folk School in the 1930s, which became the Highlander Center and still continues to this day (Highlander Center n.d.). Horton came from Tennessee, and after studying in New York, returned and tried to support the people, many of whom where quite poor. He recalled after a few years,

We did make a terrible lot of mistakes... So we had a little self-criticism, and we said, what we know, the solutions we have, are for the problems that people don’t have. And we’re trying to solve their problems by saying they have the problems that we have the solutions for. That’s academia, so it won’t work...

So what we’ve got to do is to unlearn much of what we’ve learned, and then try to learn how to learn from the people (Moyers and Horton 1982:259).

The approach of strategic participatory planning which we saw in an early session, “Gathering into Community,” is illustrated in Figure 4. The goal is to develop your community plans by eliciting diverse responses from a diversity of people, and then getting those people to work together until they have a shared plan that they are invested in.
The next image (Figure 5) is a schema about the way I teach Action Research. Action research is one way of thinking about how to have an idea about what you would like to change (maybe that is academia, for example). And maybe your training, or your wide reading experience, allows you to see possible solutions. Action Research allows you not just to have a solution in your head, but also to implement it in practice. The diagram (or schema) below looks very detailed and involved, so let us take it step by step and see what I am suggesting.
The starting point is in the middle. There is a situation. You have some idea of what it is and what needs changing, but it is certainly worth exploring further. Next, you have some idea about an action that you would like to propose, how it would be implemented, and that there will be a change from before to after and represented by the bold black lines and arrows in the center of the diagram. This is the basic idea of Action Research. Below I elaborate further.

Evaluation (at the top of the diagram) is involved in Action Research, where evaluation is the systematic research on effects of action. It is obvious that you want to show the effects of action after completing the research, but there is also room for looking at, or evaluating, the situation before the action. Not just to contrast with the after effects, but to see what actions other people have taken and how effective those have been. That will allow you to revise your idea about the actions you would propose.

Already we are beginning to think, in essence, “We had an idea of the situation (what it is and what needs changing) but we are starting to add elements (or layers or strands) that allow us to revise and eventually enrich our thinking about this.” We might also inquire to illuminate the background (the text in the middle of the diagram), to understand whether other people see the situation as we see it, or to see something that might have been obvious to us but becomes less
obvious once we start talking about it. For example, a few sessions ago (Session Five: Design Thinking Education) I described the participatory action research that was completed by the third graders on the waste of their school lunch (Shwab 1989). The initial sponsors of that research were health workers who wanted the children to drink their milk to help strengthen their bones. It turned out, when children joined the investigation, that the situation was not that children did not want to drink the milk per se, but that the milk had soured because it had not been brought in fresh that day. So the investigators started to see the situation differently. Eventually the children conveyed to the adults that the biggest issue was not about the food, it was about the amount of playtime they were getting. So they shifted the focus. Instead of the problem being about wasted food, it became about the structure of school days that resulted in reduced playtime.

Unfortunately, since the time of that research (which was more than twenty years ago) playtime has been even more reduced.

Figure 5 is also saying that if you look ahead to think about how you would decide whether the action was effective, you will end up revising your idea about what action you should implement. You want to be able to evaluate the effect, to show group “X” how effective this is, but you have to think about who group “X” is. Maybe the group is potential funders of making a pilot project widespread, or someone who can give you funds so you can continue a project. It may be yourself, so you can keep the spirit to continue working on the action and research. If you look ahead to the evaluation, you may well change what it is you are proposing to do.

What is important in the schema is the emphasis on reflection and dialogue. You might have a good idea, but after you talk with others, and reflect on what they said, you will end up with different ideas about the actions that are likely to have the effect you are interested in and be taken up by others. There is reflection and dialogue at all points in this cycle. Finally, there is a constituency building cycle. You may have a good idea, but for it to become widespread, other people will have to take it up. So why not build them in from the beginning? Then the actions that are implemented are actions that others have helped plan. You have to let go of control but that is what action research involves. To be strategic and participatory, the actions proposed take into account and involve diverse perspectives and people from the beginning who become invested in carrying out the plan. Do not just show them it works and say, “Here, it works. Now you should do it.”
There are many other things you can consider about how to move from a commitment to local distinctiveness, local particularity, and actually making some changes that use the materials that are available in that particular setting and ensure that the full range of participants are invested in collaborating to bring the results, resulting design, or plan into fruition.

As with previous sessions in Design for Living Complexities, readers are encouraged to explore a preselected set of resources and come back to the session for discussion of design sketches based on the case, “Sustenance in the City”. Modeled on the bioregional calculator (Bioregional Calculator, n.d.), or on 10+10 questions (Taylor, n.d.) (http://www.faculty.umb.edu/pjt/TenQuestions.html, readers are encouraged to create a guide for planning your transition to sustainability, e.g., What role models can you find for changing your habits? Who are your local experts, for e.g. safe soils to grow foods in, composting, exercise, car alternatives, stream restoration, safe fishing, pest control, local dialects, local history & archeology, etc....? What non-local experts or sources of knowledge do you need as well?

References


Session Nine
Spanning Distance

The theme of this session concerns people distant in space having their cultures profoundly shifted by mediated connections, especially those made around new technologies and the commodities they give rise to. Reciprocally, profound shifts can happen to people with distant origins who come together through migration of people and culture.

These themes are illustrated in Eric Wolf’s (1982) book *Europe and People without History*, his account of the changes to the Mundurucu in the Amazon as rubber began to be used in Europe in the 19th Century. (Wolf was an anthropologist with a strong historical perspective. The book describes the people that Europe tends to write out of its history, but were implicated and involved and who had a history of their own.) Wolf explains how the Mundurucu, who lived where rubber was harvested, changed from villages centered on male-headed, manioc-growing and hunting units to numerous small, female-centered households that were each linked separately to the trading post in a web of exchanges of latex for other commodities. This cultural shift for the Mundurucu was very much tied up with their growing indebtedness around rubber harvesting.

Given the long reach of commodity chains resistance to such changes cannot be focused on a social location (for example, preserving the culture of the Mundurucu, or whatever the modern day equivalent would be). Instead, we have to ask, “What would it mean to find ways in the Global North, in the industrialized world, to be accountable for the effects of our consumption, as well as the economic production and other actions (for example, military interventions that support our consumption)? And what would it mean to find ways to be accountable for those effects on people distant from us geographically, culturally, and socio-economically?” This question will come up a number of times when investigating the “Spanning Distance” theme. In the 19th Century answering this question was embedded in the consumption of rubber, so let us look at some of the things rubber went into.

The bicycle is one of the interesting areas of design that rubber eventually gets involved in is the bicycle. The short video “History of Bicycle” (Nemerhill 2008) gives an account of this history. While the video does not present a strong sense of the connections across distance until the presenter mentions the oil crisis, there is a sense of the culture, the politics of technology, and the economics in the history. Another video “The Green Machine” (Copenhagenize 2010), part
of a lecture by Iain Boal, a bicycle historian, describes further the history of the bicycle. Boal traces connections by digging into the history that we might like to know more about. (There are five different segments to the lecture if you want to learn more about the social history of the bicycle.)

One of the most striking connections that many people are not aware of is described by Mike Davis in the book, *Late Victorian Holocausts* (2001). In a review of the book, Sandhu (2001) provides an overview:

In 1901, shortly before the death of Queen Victoria, the radical writer William Digby looked back to the 1876 Madras famine and confidently asserted: “When the part played by the British Empire in the 19th century is regarded by the historian 50 years hence, the unnecessary deaths of millions of Indians would be its principal and most notorious monument.” Who now remembers the Madrasis?

.... Mike Davis charts the unprecedented human suffering caused by a series of extreme climatic conditions in that last quarter of a century. Drought and monsoons afflicted much of China, Southern Africa, Brazil, Egypt and India. The death tolls were staggering, around twelve million Chinese and over six million Indians in 1876 and 1878 alone. The chief culprit, according to Davis, was not the weather, but European Empires, along with Japan and the US. Their imposition of free-market economics on the colonial world was tantamount to a "cultural genocide"....

A particular villain, was Lord Lytton, Viceroy of India.... Lytton believed in free trade. He did nothing to check the huge hikes in grain prices. Economic "modernization" led household and village reserves to be transferred to central depots using recently built railroads. Much was exported to England, where there had been poor harvests. Telegraph technology allowed prices to be centrally coordinated and, inevitably, raised in thousands of small towns. Relief funds were scant because Lytton was eager to finance military campaigns in Afghanistan. Conditions in emergency camps were so terrible that some peasants preferred to go to jail. A few, starved and senseless, resorted to cannibalism. This was all of little consequence to many English administrators who, as believers in Malthusianism, thought that famine was nature's response to Indian over-breeding.

Before reading Davis, I knew nothing about the “Holocausts” of the last quarter of the 19th Century. Thirty to sixty million people died, a large fraction in India and China. Davis
points out the that emergency camps were called “re-concentration camps” which eventually was shortened to "concentration camps." These camps, made notorious in World War II by the Nazis throughout Europe, were invented by the British in India. Additionally, Indian overbreeding was a theme that continued well into the 20th Century and certainly influenced my childhood sense of India. If you wasted food, people would say, "Well, this could go to the starving millions in India": But the flip-side of that was that there were too many Indians and they were breeding too much. This view persisted well into the 1970s.

To emphasize the point that there is a striking history that many of us are not aware of, let me give more detail, drawing on Davis’ texts as it is put together on the Wikipedia page Late Victorian Holocausts (Wikipedia n.d.):

By the turn of the century, India was supplying nearly a fifth of Britain’s wheat consumption at the cost of its own food security (Davis 2001:59).

...Already saddled with a huge public debt that included reimbursing the stockholders of the East India Company and paying the costs of the 1857 revolt, India also had to finance British military supremacy in Asia. In addition to incessant proxy warfare with Russia on the Afghan frontier, the subcontinent’s masses also subsidized such far-flung adventures of the Indian Army as the occupation of Egypt, the invasion of Ethiopia, and the conquest of the Sudan. As a result, military expenditures never comprised less than 25 percent (34 percent including police) of India’s annual budget... (Davis 2001:60-61).

As an example of the effects of both this and of the restructuring of the local economy to suit imperial needs in Victorian Berar, the acreage of cotton doubled between 1875 and 1900 (Davis 2001:65).

During the famine of 1899–1900, when 143,000 Beraris died directly from starvation, the province exported not only thousands of bales of cotton but an incredible 747,000 bushels of grain (Davis 2001:66).

The world is connected, and the cultural changes in these cases were not just the British sense of themselves as Empire-in-progress—of painting the world red or pink on the maps from those times. While the sun never set on the British Empire, the economic ideology of liberalism—which today is neo-liberalism, or the idea that economics works best when the government does not intervene—was also part of that expansion of empire. It does not help people to be helped.

Connections of people are not just across distance but also involve people moving across distance. John Berger's classic work, *A Seventh Man* (2010), illustrates that well. As Berger
himself noted in the 2010 edition, sometimes “a book, unlike its authors, grows younger as the years pass.” His book was one of the earliest studies of post World War II international migration—in this case to Europe, but there have been many migrations since. What is striking—in terms of a question about how to be accountable—is that, when Berger received the Booker Prize in 1972 for his novel G, he devoted half of the prize money to the London Black Panthers “to recognize the tainted origins of the Booker McConnell corporation in the West Indies sugar plantations and slavery” (Barnett 2017). The other half was used to complete research on migrants, which would become A Seventh Man, in a collaboration with the photographer Jean Mohr. Berger, who died in 2017. He was officially considered an art critic, but in many ways his life work was to chronicle the experience of marginalized people such as migrants, peasants, and displaced Palestinians.

Here is a short selection from A Seventh Man:

Some of the contradictory facts [about migrants],
The migrant knows he [and in this time in Europe the large majority of migrants were men].
The migrants knows he is here on sufferance so all his spontaneous interests are short-term ones.
The migrant takes jobs no one else will.
The migrant cannot get promotion.
The migrant is first to be made redundant.
The migrant wants to earn as quickly as possible. So he is inclined to work overtime, exceed production norms...
The migrant is always liable to victimization.
The migrant is divided from other migrants and from indigenous workers by a language barrier.
Many migrants have illegally resorted to private deals with their employers. [This is related to being always liable to victimization.]
The migrant performs many of the most dangerous jobs and has fewer insurance benefits.
Migrants tend to mistrust all officials and all organizations.
The migrant has no proper life, only work; no proper living conditions, only working conditions (Berger 1975: 256-257).

The last sentence is striking.
The theme for the spanning distance session is that “profound shifts can happen to people distant in origins who come together through migration of people and culture.” The missing thing is: what shifts happen to the people—probably most of us reading this—that allow migrant workers to do the work for us? When I first went to Mexico, I realized my friends had maids, who would help prepare large meals and do all the house cleaning. This was very foreign to me. It felt quite good back in the United States where I lived and work that I did not bring in poorer people to do work—we did it ourselves. Then I realized we were for example, eating salads made of leaves that had been pre-washed and pulled apart for us. I had no idea who did that, where they did it, what their working conditions were, and so on. I can no longer feel superior to my friends who have maids. (Once I think about the people who are involved in making my life possible.)

The next exhibit connects to this session theme, as well as the focus on waste in the first session. The photo-essay by Chien-min Chung, “China’s Electronic Waste Village” (2009) depicts a village that decided to specialize in taking in electronic waste. All of the computers that we throw away end up somewhere, usually not in the American trash dumps. The city of Guiyu in China is home to five and a half thousand businesses devoting to discarded electronics, or e-waste. Tens of thousands of people work in small workshops. This is not the Mundurucu gathering latex in the Amazon in the 19th Century. This is something happening today. In the photos you can see people pulling apart the circuit boards into all the different smaller components. Some of it requires melting because there is lead, gold and copper and other metals contained in the electronics. There are no fume hoods here or special equipment to keep the vapors away from their lungs. Figure 1 depicts the town. If you look from the waist up, it looks quite pretty, but if you look down you see the black sludge in the canal.

Figure 1: “Black Water” from “China’s Electronic Waste Village” Photo by Chien-min Chung. Available at: http://content.time.com/time/photogallery/0,29307,1870162_1822154,00.html
At least at the time these images were put together (2009), eighty percent of the discarded electronics came from overseas, including the United States. It is far cheaper to break down the e-waste there, than in the developed world, where regulations require companies to follow strict guidelines. It generates seventy-five million US dollars a year for the town. Children suffer from extremely high rate of lead poisoning and there are elevated rate of miscarriages. Despite the dangers it presents, the e-waste business in Guiyu continues to thrive. The culture that is shifted is not, as was the case of the Mundurucu, from male-centered households to female-centered households. It is the culture of economic regulation and respect for people's health.

Connections across space, spanning distance seems quite depressing, so depressing that it might make us turn off. But, let me just push further in this vein before getting to a positive view. Figure 2 is a clothing factory in Bangladesh.

Figure 2: Workers at a garment factory in Savar, Bangladesh. Photograph by Andrew Biraj. Available at: http://s1.reutersmedia.net/resources/r/?m=02&d=20130729&t=2&i=755128081&w=580&fh=
&fw=&ll=&pl=&r=CDEE96S07XW00

This photo shows bright lights and people working hard. But in 2013, the Rana Plaza collapse killed more than 1,000 people—mostly women—working in garment factories. That event in 2013 shocked us all, as each time there is a disaster or fire in a clothing factory in Bangladesh, or somewhere, shocks us. And the article by Nandita Bose (2013) states that it has been quite difficult to implement the regulations that will keep the buildings and the work safe.

The question is, how can we think about taking stock—about mediating connections to distant people or people from distant places who are quite close to us now—and design alternative relationships with them. For many years The Mega-Cities Project has addressed this.
Janice Pearlman, an anthropologist who was working in rural areas in Brazil, noticed that there were not many young people. It turned out they had all gone to the cities, and were now part of the growing favelas—the shantytowns on the edge of cities. She shifted the focus of her work to the favelas. Eventually, she left her academic job to lead The Mega-Cities Project, pointing out that the mega-cities—these cities of ten or twenty million people—were growing at a much faster rate in the third world, or the Global South, than in the industrialized Global North. It was not just the rise in these cities that indicated attention has to be paid to their issues, there was also an opportunity. Perlman states:

Experience has shown that there is often a 20-25 year time lag between new ideas and their incorporation into public policy. In the case of low-income housing policy, for example, it was recognized in the early 1960s that the self-built shanty towns of Third World cities were not the problem but the solution, and that giving land tenure to the squatters and providing urbanized lots in peripheral areas yielded better results than the bulldozer. Yet it took almost a generation for these ideas to be adopted, first by the international agencies (World Bank 1972), then by national governments (early 1980s) and now finally - and still only partially - by local governments (1990:6)

She continues:

We cannot afford to wait another generation for the next set of urban policy innovations to address the needs of city dwellers...So where can we find solutions to these problems? Conventional solutions are not the answer. Jorge Wilheim, the former Planning Director of São Paulo, has calculated that it would cost the present equivalent of 30 municipal annual budgets to make up the deficits in the physical and social infrastructure using traditional approaches. It is unlikely that such resources will be available in the foreseeable future (1990:6)

(She is writing before the Worker’s Party candidate, Luiz Inácio Lula da Silva, had won the Brazilian presidential election. It would be interesting to see whether her predictions that the deficits in social and physical infrastructure would be addressed, once you had the Worker's Party into the government in Brazil.)

Perlman goes on to say that not only is the money not likely to be available, but (quoting a World Bank report by Per Ljung):
Most institutions are responsible for managing urban growth are weak and, with few exceptions, past government policies have tended to worsen urban problems, rather than contribute to their solutions...

Experience over the past 20 years shows that, since intelligence is not distributed along class or geographic lines, the most promising innovative approaches often come from local experience - from the people, community groups, street-level bureaucrats, and small scale enterprises closest to coping with problems on a daily basis.

There is enough energy and creativity in the cities today to address the challenges, but there are too few mechanisms to channel these forces into the policy making process or to multiply the effects of approaches to that work (1990:6-7).

A special focus of the Mega-Cities Project has been to acknowledge that there were innovations happening around the world, including the favelas in Brazil, and to bring them to local people making innovations elsewhere, in West Africa for example. Perlman was very much a connector from local to local—not reversing the top down direction of influence to bottom up, but connecting the bottom level work across different places.

As with previous sessions in Design for Living Complexities, readers are encouraged to explore a preselected set of resources and come back to the present and discuss of design sketches based on a case. “Ethical Long-Distance Connections” invites us to ask: How would we create ethical long-distance connections focusing on us as consumers? How can we come together to take stock of our mediated connections to distant people and design alternative relations with them? Unlike earlier sessions, the purpose is not to design a playful community gathering (for example, a makerspace that pays attention the local community that supports our work). Instead, the purpose is to take stock of our “mediated connections” to people that we do not know (and perhaps we do not even know about), and design alternative relations with them. This is clearly a challenge of design, but a difficult challenge that involves learning a lot more about the world.

The case suggests looking at the Mega-Cities project, as a positive model of spanning distance, even though that is not specifically connected to our consumption of products. You could also examine the FairTrade approach and criticisms of it as a way to identify critical thinking themes about the design of fair trade—or what it means for trade to be fair (O’Neill
Then, you could use the tool of freewriting to arrive at an angle or focus so as to avoid being overwhelmed by the huge totality of what is going on. Are you more interested in designing an ethical system for a specific product, defining what ethical principles are for mediated connections, gathering people together to design an ethical system, establishing and maintaining the necessary communication or information systems, influencing people's attitudes or behaviors, or something else?

If you are concerned in a positive or critical way about "profound shifts... happen[ing] to people distant in origins who come together through migration of people and culture," then consider the steps (as against some *deus ex machina* intervention) through which the consumers can respond. Indeed, consider the themes of earlier sessions, such as "Gathering into community," to increase the chances that you and/or others could actually take up what you design.

To finish this ninth session, I invite readers to continue working on critical thinking principles concerning spanning distance through mediated connections. You can share and discuss the results of the design sketch in the public blog, [http://bit.ly/dflcblog](http://bit.ly/dflcblog).

**References**


Session Ten
Integration of Diverse Social and Material worlds

We have started to build up many angles in the previous sessions on critical thinking about design. If we want to put them together (especially the theme from the previous session on spanning distance), how can we actually do that in a deliberate, design-like way? The critical thinking theme of session ten addresses the question: Instead of dividing real-world complexities into many local situations (as if they were well-bounded systems with other processes pushed into the background or hidden for the time being), how can we examine “intersecting processes” that cut across scales, involve heterogeneous components, and develop over time?

In this session we examine different images of intersecting processes, and what that actually means. Once we do that, there is always a tension between, on one hand, local knowledge and solidarities forged through working and living together in particular places (for example, we saw that in session eight on local particularity) and, on the other hand, application of trans-local perspectives, abstractions, or other resources—or withholding such resources. (For example, the Mega-Cities Project in session nine was an example of trans-local perspective—something learned in the shanty towns of one Mega-City was made available to people who were innovating in an informal way in the shanty towns of another Mega-City.)

Within the intersecting processes, there are multiple potential points of engagement for a designer, which need to be linked together transversally in a manner that is intentional and explicit. Transversality is about scale-crossing: if sustained engagement in local situations is desired in order to ensure that design is not a "solution... for the problems that people don't have" (Horton 1982), what else is needed to mitigate the consequences of decisions made in governments and corporations operating on a larger spatial and temporal arena? Addressing the question is a big challenge for a designer. This session’s exhibits look at the framework and the possibilities that are available.

The first exhibit on integrating diverse social and material worlds is the work of Ian McHarg, in his classic text, Design With Nature (1969). The slides from “Overlay Method for Site Analysis” (King 2012) will provide images that recapture what he was doing. The basic idea, which is familiar today in the age of geographical information systems, is to look at the use of the land from multiple lenses or overlays. Figure 1 illustrates three overlays: the agriculture value, the aquifer value, the ecological value, which, together, will determine the best route or
road to be put through (the fourth overlay at the bottom of the figure). McHarg was also interested urban development land planning. King shows six different pictures of what needs to be integrated if a designer is going to pay attention to the diverse social and material worlds involved in land planning.

Figure 1: “Overlay Method for Site Analysis” available at https://openlab.citytech.cuny.edu/kingsiteplanningfall12/files/2012/02/05-1250-King-Site-Planning-Graphics.pdf

King (2012) also points to some communities where planning has been done. We readily appreciate the tree lined streets in the suburbs of Illinois, courtesy of Olmstead and Vaux. The historical origins of such communities can be seen in planned communities in England and the diagrams of Ebenezer Howard, such as Figure 2 showing, for example, a central park, houses and gardens, cow paths, and "allotments" (the English word for strips of land where the people from cities can grow their vegetables), children's homes, agricultural colleges, and more. This vision of “slumless smokeless cities” has a central city and satellite cities, connecting them with railway branch lines and canals. Only parts of that railway line had ended up being built; the rest was blackberry patches, where we would (apropos the issue in the session on play) make tunnels and harvest blackberries. Later, those patches were cleared to become bicycle paths and recreation.)
In Howard’s plan, there is forest, but there is also an insane asylum, home for inebriates, and a home for waifs. The things that are not wanted in society are put away. Interestingly this diagram has no prisons. In the city of Boston, where I know live, each island in its harbor has a history, which often predates Ebenezer Howard's vision of places where society put what it did not want. One of the most recent examples is an island that has been re-built up with the dirt that was excavated for The Big Dig—a few miles of freeway built underground. Some of the other islands have been sanitariums, places where immigrants would be kept until it could be clear that they are free of diseases, homes for wayward boys, and military firing ranges. There is a continuing history of society trying to find somewhere to put its social "waste" products.

The views of Ian McHarg are being picked up by firms that follow his approach; it is a more familiar idea today. As with the visions of Howard, they are sometimes easier to plan on
paper than they are to put into practice. A group in the city of Melbourne, Australia, The Victorian Eco Innovation Lab, are trying to do urban-eco-transformation (Victorian Eco Innovation Lab n.d.). The links on the website give details of low carbon living, eco-architecture, transforming responses to climate extremes, food hubs (following up on the theme that we saw before about food democracy) food supply scenarios, local creative food economies, mapping, agricultural land capacity (so it is not just taken over by suburban growth). This is being attempted in a city, Melbourne, that spreads out over an area similar to Los Angeles in geographical scale.

Again from Australia, the idea of a Urmadic University—“urban nomadic”—has developed. While the Victorian Eco Innovation Lab emphasizes design in a particular place the Urmadic University continues this but also accepts that the knowledge (and the people who can stimulate knowledge) might not be from that place. In the Urmadic University, there is room for moving ideas, not moving people. In the audio clip from the radio show Future Tense, Antony Funnell (2011) interviews some key designers who are interested in the idea. One of them, Tony Fry posits that the Urmadic University asks us “what do we really need to learn in the circumstances we are in? ....How do we disperse that learning across the globe?” Cameron Tonkinwise proposes that sustainability is normally associated with questions of the quality of resources in the future.... but it’s also a decision about how we want to live....The way the [sustainability] discourse happens at the moment, it’s very much based on preserving the present and … find[ing] ways of resourcing the current life style. And it’s never a questioning of those lifestyles. Or, if it is, then you are marginalized and considered radical....The really important thing is that it is an opportunity to think about how we can be different. How else could we live? (Funnell 2011).

Notice this quote from Tonkenwise is focused on critical thinking—understanding by thinking in relationship to alternatives.

In the Urmadic University ideas and perspectives can travel and be connected across places; this was also the theme and design sketch of session nine, Spanning Distances and is also the issue of this session, Integration of Diverse Social and Material Worlds. If session nine emphasized how the worlds are connected, and for a designer, we have to think about how to do this intentionally. The next images then are attempts to think about ways to represent the
connections, so that you can digest, and begin to think about transversal engagements that pay attention to the connections across the “intersecting processes.” This first example is a complicated diagram (Figure 3). While I will not narrate every detail, let me give you a sense of how it can point you in useful directions.

![Figure 3: Intersecting Processes leading to soil erosion in San Andrés, Oaxaca. (Taylor 2005a)](image)

This diagram summarizes the work described by Luis García-Barrios, an ecologist, and his brother, Raúl García-Barrios, a resource economist, on the severe soil erosion in the mountainous area of a particular municipality in the state of Oaxaca, Mexico, south of Mexico City (1990). There are four strands with little dotted lines connecting them; time goes from left to right, 1500 to the year 2000. We might think about these dotted connections being the intersection between these processes, but once these different strands are explained, the processes involve the interconnections as well.

What the researchers noted was that the severe soil erosion had occurred during the Twentieth Century. There had previously been a highly productive period when the hillsides were heavily terraced and the population density was high. As they looked back further in time, they discovered that there was an earlier time when terraced farming had been productive. The
labor had been involved in maintaining these terraces and the production on them. Steep hillsides and terraces have to be vigilantly maintained. If someone uphill abandons their terraces and there is a severe rain storm, the erosion that occurs on their terrace comes down hill and messes up everyone else's terraces. So it is very important, therefore, that everyone works together. It is important to plant the seeds quickly at a certain time; a well-organized labor would do that.

The Spanish invasion, however, led to diseases and to a collapse of the population. On the diagram, this reads from the lower left—external situation of the Spanish Invasion to the upper left—the demographic collapse in the population and labor strand. Labor refers to people organized in particular modes of production, thus the other two strands—the agro-ecology and the local socio-economic institutions. The top three strands might be local, but they are very much connected to the “external” situation and the interventions. (Later I will explain why “external” is in quotes.) The demographic collapse led to a labor scarcity. The result is that the terracing area of ecology gets abandoned in favor of labor-saving practices all from Europe—having goats, plowing, wheat. Although these require less labor, unsupervised goats go up and down hillsides, and erode those hillsides.

Moving to the right in the diagram, the church replaced the traditional authority (what you might call a moral economy, where the leaders or the rulers controlled the labor, or the products of the labor, but also had obligations to look after the people in hard times). Some markets developed. With Independence from Spain the power of the church reduced, and the church's moral economy was replaced by a private one. That private one is under the authority of the caciques, or the chiefs, whose rise the church had sponsored during these centuries. They retained the land concentration and the labor discipline for sustainable maize production, terracing, and cajete sowing (a highly organized sowing of seeds). They also managed diversity on different slopes and discovered where different varieties of plants worked best. The private moral economy from the caciques took over the one that was under the church before Independence. Independence, in this example, is something that comes externally to that region; it is certainly not something that was generated by the people in that region of Oaxaca. But it definitely influenced them.

The Mexican revolution, a hundred years ago, eventually brought land reforms, which helped undermine the power of the caciques. Industrial development also undermined their power, and there was an opportunity for people to migrate outwards from their rural areas and then bring back money and cash back. The Garcia-Barrios brothers call this the semi-proletarian
economy: the income from the workers in the cities comes back to the local rural areas, and it affects who has influence in those areas. Previously, there had been a population increase in this highly productive region. There was not many market exchanges with the outside world. It was closed off to connections with the outside world, which might have brought in influences that could undermine the power of the caciques. In the 1900s the self-containment broke down.

There again population decline—this time not from disease, but from people moving out. There is also labor scarcity, and the land was less intensively cultivated or sometimes abandoned; maize was grown for subsistence and goats were brought back again. With the collapse of the traditional social and economic institutions, there was not much regulation of goat grazing or maintaining of the terraces; bad soil erosion occurred. If you see pictures of this area, it looks like denuded hillsides with gullies running down the hillside. With respect to cross-connections and cross scales, not only did people move out to developing industries, but the government policies favored cheap urban food, because it was not cost effective to start to grow the maize again and market it to the cities. (Most of the maize in these areas was grown for subsistence only.)

The picture here is that the complexity is divided into different strands: population and labor, agro-ecology, (or more generally, the productive regime (it might be fishing or something more industrial), local social and economic institutions (that maintain the population as labor which supports particular production schemes). All those local strands are very much connected to the “external” situation. External is in scare quotes because in some ways what is happening outside, say in the 1800s in the municipalities and cities, is the beginnings of Independence and increasing market economies, or a commercial merchant economy, but his had been closed off by the caciques in this area. They are responding to what was outside, even if they closed themselves off to it. The awareness of the outside shapes what happens inside.

This is a picture of a long span of what we might call intersecting processes. You might ask, “How does that help us design anything?” Suppose that the idea, if you had wanted to get involved to improve the environmental situation—this heavily degraded, unproductive hillside—was—lets rebuild the terraces. People who know about terraces, engineers, could come in, but they would not get very far without financing. There has to be a connection with people who might be trying to moderate the liberalization policies, which have reduced any subsidies back to the rural areas. The engineers might also recognize that there has to be a socio-economic institution to maintain those terraces. So they would connect with the development workers, or
the anthropologists, or the local people who have gone away and become students but might come back. All these people could get involved with the traditional institutions and develop leaders who will be listened to. There might also be someone who would advise on land use and on regulation on goats, on ways to keep goats from destroying the hillsides more. Someone else might even say, “I'm not going to work locally, I’m going to get involved in World Bank policies.” There are many different interventions, which might be chosen according to your background and skills, your profession, your interests, your connection over your lifetime to this particular area. None of them are going to be sufficient on their own. Each engagement is partial but needs to be pursued jointly. They have to be connected together. That is the transversal engagement, the connections across each scale.

The same picture of intersecting processes can play out over the personal life course. Figure 4 is a diagram adapted from the book *A Secure Base* by John Bowlby (2012). Bowlby was a developmental psychologist. Here he was trying to represent the work of two medical sociologists, Brown and Harris (1978), whose work examines the high incidence of hopelessness or clinical depression in working class women in poorer areas of London in the late 1960s. Ignore the hypothetical genetics or biochemistry strand, which I have cut out of this illustration, to look at the three strands that Bowlby draws out from Brown and Harris' work. Again, we have the cross connections and the strands. In the bottom right corner, the timescale is over a person's lifetime. What Brown and Harris discovered about women who became clinically depressed is that they were more likely to have had (in comparison to equivalent women who were not clinical depressed) a severe event in the previous year. And the likelihood of a severe event increased if these women had an unsupportive partner (or lack of a partner), or if there were chronically difficult living conditions. These proximate conditions—severe events—were also linked to events early in one’s childhood. The mother (or a primary care giver) was lost by age eleven, which led to a lack of care.
Let us in the picture, making a story of a life. If you are born working class, you are more likely to grow up working class. I say “more likely” and use dotted lines, because I am not trying to say everything is determined, or that it is inescapable. But if someone has grown up working class, they are more likely to continue in that class, and more likely to have chronically difficult living conditions. Chronically difficult living conditions increase if a woman lacks a partner or a supportive partner. Looking back to the loss of mother and lack of care, in these periods, these young girls might end up in custodial institutions. One way to escape from custodial institutions is to partner up with someone. Premarital pregnancies lead to having children when young without the education that allows one’s own independent income, and thus helps reinforce the chronically difficult living conditions of a working class life in the inner city area of London. These early relationships are less likely to be long term, which decreases the likelihood of having a supportive partner, or a partner at all. These difficult living conditions without a supportive partner and with children are more likely to lead to a severe event. For example, being distracted by one child, another child knocks the pot off the stove and gets a severe burn.

These examples from the previous paragraph are in the top two rows: class and family, which link together to promote the idea of intersecting processes over a personal life course. The
psychological dimension is what Bowlby added. Given his theories of secure and anxious attachment, he suggests (expanding Brown and Harris’ work) that the children who lack care (if you're anxiously attached) are less able to derive or elicit the care needed. The lack of care affects psychology in terms of a sense of helplessness and low self-esteem, which then continues into adulthood. In Bowlby’s view of the world, it is then more likely that a severe event will lead to a hopeless depression.

The asterisks in the diagram point to possible interventions or engagement. The picture before of there being multiple points each partial and needing to be linked together, can also be drawn out of this diagram. For example, if you want to do something about the hopeless depression, you might think of counseling the girls during their teenage years to have higher self-esteem. You might think of counseling them to learn about contraception and assertion of contraception in a sexual relationship. You might want to make the custodial institutions more humane so they less likely to be places that people want to escape from. You might also, as a social worker or a person associated with hospitals seeing a sick woman be admitted or dying, make sure that there is some system to care for the children who are left—care from relatives and care from their schools. You might also work at the level of social policies that make it easier for social mobility away from less chronically difficult living conditions. There are many different kinds of interventions, or engagements, which could be favored by people differing according to their skills, psychological, economic, and social processes. This is a picture of intersecting processes and transversal engagements.

Figure 5: A screenshot of the Tiki-Toki timeline tool, “Putting Connections People Have to ‘Science for the Public’ in Context.” Available at: http://bit.ly/sftptime
Figure 5 is an attempt to think about how to map these processes by a group for themselves, that is, not just have resource economists and ecologists look back and do the history of five hundred years in a region, or medical sociologists piece together the statistically relevant factors of the personal histories of many women. Figure 5 may look quite messy, but let me explain. Science for People, an activist organization in the United States, was very active in the 1970s, but eventually faded out in the late 1980s and gave way to many different organizations. In an April 2014 conference, “Science for the People: The 1970s and Today,” people came together to reflect on its history and think about its relevance in the present. I gave a plenary talk at the conference. As preparation I tried to think about how people made their lives and their activism in a wider context. I invited people to submit one particular event that had been important to them personally in their lives, another thing that had been important in the intermediate contexts in the organizations they had been involved in, and a third thing that was happening in the wider world. I tackled these “local,” “intermediate” and “global,” and assembled them in a Tiki-Toki Timeline, putting the connections people have to “Science for the People” in context.

The year at the top is in the center of the screen shot. On the link for the schema, this slider at the bottom can be moved to see other years. About late 1969, people mentioned the Vietnam War, the Civil Rights Movement, Vietnam War, New Left, Vietnam War and Napalm, Anti-Vietnam War Protests. Clearly the Vietnam War was obviously a key part of the context for the respondents. Then the environmental movement is mentioned as we move into the 70s. We can also explore what happened personally: someone had a father that believes medicine is for everyone, not just the elite; involvement in Students for a Democratic Society; anti-war; hospitalization for birth control pill use. There are different kinds of ways people's life experiences get connected to an intermediate and a wider context. Although I say “connected,” this diagram does not have any of the across-lines of the previous diagrams. A second step would have been to invite contributors to think about the ways these layers and these levels are cross connected. Let me speculate about what might have emerged. The Vietnam War got people to join anti-war movements, and go into the Peace Corps to do something, other than science for chemical companies that, for example, were creating Napalm.

By the 1980s, people recognized that change is difficult psychologically, but respondents noted encouragement from some more senior researchers and a sense of gladness that Science for
the People existed and had influenced them. In a later period, there are little projects, for example, ethno-mathematics, that continue across a long period, the Loka Institute, which promoted democratic influences on technology, and sustainable aquaculture. Science for the People faded out by the late 1980s, but for the people involved—at least the people involved that came to the conference in 2014 (and that is not a representative sample of all people who have been involved in Science for the People)—you see that there was a proliferation of different projects for social change. For example, the Sociobiology Study Group continues in two different genetic study groups to this day: Gene Watch and the Genetics Studies Working Group.

This exercise suggested that it is possible to collect from a group of people enough pieces to put together a picture that would be meaningful for them. There would definitely be some more steps to make sense of the connections of the person or the individual to the context, and then to develop the partial engagements and put them together so they can have some influence. That is, to get to the intersecting processes picture of the local and the translocal, the local in the wider context that we had in the previous two diagrams.

The last example for this session is the epilogue from my 2005 book, *Unruly Complexity*, which consists of three stories that, personally, to re-read more often than the main chapters of the book (Taylor 2005b). Those stories are of people making engagements that connect, on the one hand, local knowledge and solidarities born of working together and living together in particular places, and on the other hand, to the trans local perspectives or other resources. The first story is of a tree planting project, which I have mentioned before in Session Eight (Local Particularity). The organization CARE financed an agroforestry project in Kenya. The researchers, Renko Vonk and Louise Buck, had knowledge from their own training in agroforestry, about which trees would grow well in this place. They said their job was not simply to go out and tell people what to grow, but to learn from them. But they also had a commitment to making sure the trees were something that the local people became invested in. One of the things they did was to survey the people, to talk with them, to find out what trees and plants they thought should be grown. Thirty species were proposed. The researchers knew that some of these suggestions were ill-advised. Instead of just studying how the four tree species they favored would grow in this area, they studied how the thirty-something trees grew. As they listened, they learned that they had not fully understood why people were planting certain tree—to chop off branches, to make fences, and burn to smoke the fish that were coming from the lakes where the native species were being outcompeted by invasive fish species that needed more cooking to
make palatable. They discovered more intersecting processes than they had known about. They also trained local people to learn how to do similar listening. Moreover, they trained equal numbers of young men and women; they pushed back against the male-domination of those traditional communities by allowing the young women to be just as involved. It was not simply going with the local knowledge; it was bringing their own perspectives—what they knew about trees, their own resources, the finances of CARE, practices of attentive listening and gender equity—to the development work.

This story illustrates the design themes of connecting local knowledge and solidarities with trans-local perspectives and resources. The other two stories also play upon that theme, but leave an open question. How much we can use a combination of understandings of the local as linked to a wider context to build engagements or to connect engagements that can resist larger changes that are drive from the outside? In a previous session I have talked about the active community planning in West Nipissing, in Northern Ontario, Canada. The people were very involved, and very creative in terms of creating new economic and community organizations, including new economic possibilities and organizations. But that was undermined, when the largest employer deciding to pack up the paper mill and no longer produce in that area.

Examples of connections from the global, political, and economic contexts to the local area can be depressing, such as the Late Victorian Holocausts. But the idea is that we can sketch out intersecting processes and begin to think about multiple points of potential engagement, make connections among them, and thereby build up the capacities to resist or respond to changes that are made by people with more power in distant places.

As with previous sessions in Design for Living Complexities, readers are encouraged to explore a preselected set of resources and prepare design sketches based on the case, “Compose your life as intersecting processes.” Pay attention your life, after all, it is you who are going to make engagements in your world—unless you simply join the Army and take orders—and try to do it in a way that does not make it merely personal, but connects with the wider context. In a way it is similar to what the Science for the People group did through contributions of multiple people, but in this case, you multiply the perspectives for yourself. The resulting “wall of wonder” or “historical scan” tries to place the project of your past and possible future lives in a wider context.
To finish this tenth session, I invite readers to continue working on critical thinking principles concerning design. You can share and discuss the results of the design sketch in the public blog, http://bit.ly/dflcblog.

Case: Compose your life as intersecting processes
0. When you present your sketch, feel free to mask items that are too personal to share—the point of the case is not to reveal every detail, but to go through the process of teasing out different strands that shape our past and possible future lives.
1. Follow the directions for a Wall of wonder/historical scan (Taylor and Szteiter 2012) where your own life is "project to be undertaken" and you are "setting the scene" for this project. Because you are doing this for yourself, you will need to generate 30-40 Post-its.
2. "Local" is Personal event or experience that was significant to you (something in your family, life course, workplace, studies, etc.); "Regional" is Intermediate-level event or activity, a specific arena or project you have been involved in; "Global" = Wider-world event or change that led to or influenced your personal & intermediate-level experiences.
3. Once you have the Post-its, follow the script under "At the end of a group project or course," but in this case there is no-one other than you posing and answering the questions. (Figure 6 derived from reading Peter Taylor's biography [written by N. Rubin] as it relates to becoming a teacher of Action Research)
4. At the end, sketch out some possible transversal engagements.

### ARE WE THERE YET? NO—KEEP SWIMMING*

<table>
<thead>
<tr>
<th>Australian Culture + Counter-culture</th>
<th>Collective-supported study &amp; Responsible Teaching</th>
<th>Self-conscious, documented journey of toolbox assembly</th>
<th>Distinctive Action Research pedagogy gets noticed &amp; published</th>
</tr>
</thead>
</table>

* In an Australian children’s joke, the child on the way to their vacation asks, as children often do, “Are we nearly there?” The parent answers: “Shut up and keep swimming.”

*Figure 6: “Are we there yet?”*
References


Session Eleven

Keeping Track

The critical thinking theme for this session is that the possibilities for surveillance are an unavoidable by-product of standards and of keeping track of the effects of one's design. This theme presupposes that we have standards and we do keep track of the effect of our designs.

The first example concerns standards. In a review of the book *Standards: Recipes for Reality* (2012), by the sociologist of science, Lawrence Busch, by Morozov (2012) (an internet skeptic) begins by asking,

What would happen to globalization if shipping containers had not been standardized? Where would modern science be without standards for conducting experiments or breeding laboratory rats? How far would modern medicine have advanced if radiographs from one laboratory could not be read in another?

In this case, Morozov is asking un-skeptical rhetorical questions, assuming that his examples point to standards that we have come to accept. We could, however, take these questions and ask, “where *would* we be if we try to look for places where shipping is done *not* in containers?” We could also ask, “what happens to communities when shipping shifts to containers, instead of being the traditional occupation of longshoremen?”

It is true that, as Morozov says, “standards play a consequential role in every aspect of our lives, from the quality of our food to the octane of our gasoline.... It is surprising we do not reflect on standards more often” (Morozov 2012). Picking up on Busch's book, Morozov describes how standardization really began in the Enlightenment (the 18th Century) with a “belief in universal narratives and the rationality of human reason” (ibid). With the French Revolution (1789-1799), for example, standardization was evident in the metric system. Previously there were many different systems of weights, or even the same system, but with different weights in different communities, but these were replaced by the metric system. (The revolution even proposed to replace the twenty-four hour clock with metric time, but that change did not take off.)

Morozov draws on the work of others in his review: “Writing in 1904, Thorstein Veblen gave an apt analysis: ‘What is not competently standardized calls for too much of craftsmanlike skill, reflection, and individual elaboration, and is therefore not available for economical use’” (Morozov 2012). We might see a critical thinking theme from several of the previous sessions — look at the importance of craft—versus standardization. We have certainly promoted reflection
and allowed for play or individual elaboration. So does that mean we have been promoting a view of design that is not connected to “economical use”? What would it mean, therefore, to allow for play and still accommodate the constraints of economical use?

As Morozov’s review continues, not everyone embraced standardization. “Many of Veblen’s contemporaries thought that standards would eliminate individuality and make life dull. Others feared that if the quality of products were fixed through standards, the terms of competition would focus on price alone, destroying any companies unwilling to lower their, well, standards” (ibid). I remember as a teenager in Australia my father was working as the head of the Plastics Institute of Australia, an industry group that was promoting plastics. At the time, I was beginning to be an environmentalist. I was concerned with trashcans—which had been metal but were being replaced with plastic—because the plastic would fatigue and crack. I said to my father, “Why don't they create plastic trashcans that last longer?” He replied, “anyone who does that it would have a more expensive product than their competitors, and they would go out of business.” that might call for a standard of longevity of trash cans to be imposed by some authority; then the competition could move up to that level. Morozov (2012) continues:

Miraculously, that problem has been solved—with the help of standards, or what Mr. Busch calls "standardized differentiation," whereby standards are used to differentiate rather than to standardize. Today we have so many varieties of jarred pickles because it became possible to "fix"—both in the trademark and in the mind of the consumer—the attributes of each variety, one differing from another according to color, texture, size or any number of other criteria.

It would be interesting to see as a critical thinking theme, that is, a theme for understanding through holding practices or ideas in tension with alternatives, just how many areas of life have been dull-ified by standards and how many have allowed for the variety that is represented in these kinds of examples. To get a handle on this topic, you could read Busch's book and others by sociologists of science who think a lot about the role of standards in scientific and technological development and the institutions that surround and support them (e.g., Bowker and Star 2000).

Another question we might ask, “What do standards have to do with record keeping?” One answer might be that if something is supposed to be held to some standard, someone has to check that it meets that standard. Understanding and checking whether standards have been maintained is representative of the record keeping side of standards. In this way, there are
multiple industries and apparatuses of checking standards. In the next example, standards and record keeping go together quite neatly.

The short article, “When Good Record Keeping Saved Lives in Architectural CAD Services,” grabbed my attention because I wondered what examples they would use. It is about computer-aided design (CAD), not really about saving lives. But metaphorically it describes a moment in customer service when the customer is asking the service provider, "But why didn't you do what we asked?" The company can go back to their records, and their records show they did exactly what was asked; the customer had forgot that they had changed their mind. That is how record keeping would save the company’s life. (The article also explores the way CAD brought standardization into architectural design.)

Atul Gawande, a surgeon and essayist, has emphasized in his book, The Checklist Manifesto (2009), that record keeping, standards, and checklists have overlapping roles to play. The book lays out how some requirements in standardized procedures can save literal, not metaphorical, lives. In a review of the book, Sandeep Jauhar (2009), tells a personal story that fits in well with Gawande's theme:

Not long ago, I walked in on a group of medical residents inserting a central line catheter into a patient in the intensive care unit. They were gowned and gloved, working quietly over the patient’s neck, exposed through a small hole in a sterile blue drape, where a thick needle was entering under the collarbone. I noticed they had neglected to drape the abdomen and legs, but at this point it didn’t seem wise to interrupt the procedure, so I let it go. They had also apparently forgotten to don face shields and caps. I let that go, too. Like them, I wanted to get the procedure over with as quickly as possible before something bad happened.

After the senior resident pasted a clear sterile dressing over the insertion site, I congratulated him on a job well done. But two days later, the patient developed a fever and her white blood cell count shot up. The line had to come out. Bacterial cultures revealed it was infected.

Doctors often overlook or omit steps in the multitude of tasks we perform every day. As Atul Gawande argues in The Checklist Manifesto, these are situations where a simple to-do list could help. For example, a five-point checklist implemented in 2001 virtually eradicated central line infections in the intensive care unit at Johns Hopkins Hospital, preventing an estimated 43 infections and eight deaths over 27 months. Gawande notes
that when it was later tested in I.C.U.’s in Michigan, the checklist decreased infections by 66 percent within three months and probably saved more than 1,500 lives within a year and a half.

Gawande's book talks about checklists in many different fields, in addition to medicine. Most interestingly, the book also discusses resistance. Even when doctors are confronted with these figures, they do not necessarily follow the checklists, or they get angry with people who remind them to follow the checklist.

From my own personal experience (especially after reading the book), I would create my own checklists; then I would forget to read them. Or I would think, “I can do these tasks this time without checking the checklist.” Then new situations would come up. For example, in recording these presentations, I once did one directly after the other. But before I did the second one, I checked the quality of the first recording and I had the earphones in my ears so I would not disturb anyone else in the house as I listened. Then I started the second one, and the earphones were still in. I completely overlooked that, because I still had the earphones plugged in for the second recording, the microphone was not recording. I ended up having to record the session over again.

Standards, record keeping and checklists all go together, but there is still the social dimension of how checklists are implemented. In Jauhar’s review, he is critical of people slavishly following checklists when some judgment might lead one to argue that a set of procedures is not appropriate for a particular patient. That person would be pushing back against standards (thought not creating something dull) because standards would be getting in the way of using one’s judgment. I do not think that is the only reason that doctors resist checklists, but you are invited to develop your thinking on the topic.

The next example is Scorecard. The whole record keeping enterprise, as implemented in legislation and regulations, has led to companies having to report the toxic chemicals they use. Those reports go to the government and they are available for anyone who wants to check. In the early 2000s, an activist group said, in essence, “let us make those records available to people” so they created Scorecard, “the pollution information site.” To access the information, you can in your zip code and, using drop down menus, you can find out:

Who’s polluting,
The top ten polluters,
What pollutants do the most harm,
Compare communities in states, 
Search by company, location or chemical 
With a little searching, you can find out which companies are using pollutants and chemicals, and whether they are active in your community. This effort is making information available on the basis of standards and record keeping requirements, and then making that information available to each of us via the website. For example, when I enter in my zip code (the basic information required by the website to conduct searches), I get a list of potential avenues to explore. While I have to click multiple links to actually find the details, I can access a “Top 10” list of polluters in my county.

Some economists have showed what they call a Scorecard Effect. Scorecard displays the top ten most polluting companies in the area. As a consequence, it would be advantageous for a company to reduce its pollution enough so that the company would fall to number eleven. The economists were able to show statistically show that there was an association between having been in the top ten and then going on to reduce pollution so the score would fall below the top ten. Scorecard seemed to be having a shaming effect. Although we would need to check whether that was a real cause for why companies had lowered their pollution. In my case, the most basic idea of Scorecard is that communities and individuals can get this information, know what is going on, monitor polluters, and perhaps gather together to do something about it.

Other places where people are gathering information together involve a centralized group and not so much decentralized access to that information. The Ontario Health Study started in the last decade, and quickly a quarter of a million people signed up to provide information at regular intervals (every six months) about their health. They complete specifically designed surveys, which have a different focus each time. Two promotional videos (Ontario Health Study 2011 and 2012) encourage people to participate in a research program that promotes more individualized health care and uses real participants in the program to communicate the benefits of participating.

Scorecard is making the centrally collected regulatory information available in a decentralized way (i.e., by gathering required governmental information together in one location and creating ways to access that information in a meaningful form). Ontario Health Study is drawing many people into the study in an effort to help people be concerned about their health. The researchers, scientists, and epidemiologists then use that information, and eventually it may feedback to help advise and structure policy. Exactly how that advice will take shape and how it

---

100
will influence people is not currently spelled out in the design of The Ontario Health Study. It would be interesting to put these two methods of organizing and distributing information together. How could information on the healthy habits of people in a community feed into a Scorecard-like system?

In Toronto, there was an earlier effort to design a similar program to the Ontario Health Study. "The Perspective Study" followed a group of people through time. John Frank, a researcher who was involved in the design of the study, was worried about building in features of the design that would limit the kind of answers you could get. The problem as conveyed by Frank (2005) is as follows:

If you are concerned about health, you may be concerned about genetics, or the biochemistry of people, as well as the environmental factors they are exposed to over their lifetime. Things happen by interaction between genes and the environment. (Personally, I would also add the organism, not just reduce the organism to genes, and not just reduce the organism to a passive recipient of environmental factors.) We do not know much about many chronic diseases, such as why asthma is increasing in frequency. We need to understand the causal pathways over time and then develop prevention strategies, as they relate to population health. In the Ontario Health Study they collect blood samples and get participants to provide some information about their locality. It would be interesting to find whether the Ontario Health Study then measures and records environmental concerns in that locality, as Scorecard does.

Even if it did, there would be an uneven playing field. The genetic exposures can come from taking one blood sample that will do for the lifetime. Research centers can take the samples easily from a swab and store it. One sample is relatively cheap and getting cheaper when you turn genes into gene sequences these days. However, the environmental measures vary over time, so new samples have to be collected at different intervals from the same participants. As a consequence collecting the data can be expensive. It is difficult to store the information, particularly if you do not know what the important factors are that need to be collected. It is getting costlier as people become aware of more and more chemicals and other exposures present in the environment.

If future researchers come along in thirty years or in fifteen years, and they want to understand why some people are getting diseases and others are not, both genetic and environmental measures are necessary. If there are only the genetic measures, researchers can only look at the genetic measures. It's like the drunk looking for keys under the lamp post. But it
may be that the overall cause of pathways depends on how the organism has developed, how the genes become active in the organism’s development, and in particular, how genes and the organism respond to environmental exposures.

Frank identified the contrast between, on one hand, the large size, but very “thin” cohorts that have arisen over the previous decade or two, for example the BioBank in the UK and, on the other hand, the small cohorts that collect a lot of information. In Southampton, England, there is an ongoing study that particularly wants to look at women and children over time: before they get pregnant, when they give birth, and in the children’s lives afterwards. The sample size is more than 500,000 in the UK BioBank; in the Southampton study, less than 30,000. Both kinds of information are valuable for future researchers, but you are more likely to have collected the genetic information.

The Ontario Health Study and Scorecard both rely on the potential of the internet for connecting and communicating with people outside a centralized system. There are overall criticisms of the promises of doing things over the Internet. Morozov argues these points in his own books. For example, To Save Everything, Click Here (2013) and an earlier book, The Net Delusion (2011), expound on the current and potential problems of Internet rhetoric. He states, “the dangerous fascination with solving previously intractable social problems with the help of technology allows vested interests to disguise what essentially amounts to advertising for their commercial products in the language of freedom and liberation” (2011:304). His book has many examples of people promoting the Internet and the web as a uniformly progressive technological development. It would be interesting to see what Morozov thinks about cases such as Scorecard and the Ontario Health Study.

Morozov’s quote is one example of his contrarian attitude from The Net Delusion. In his essay “Every Little Byte Counts” (2014) he draws on on the work of the philosopher G. Agamben, to suggest that “there’s also a subtler, more insidious type [of power], which limits not what we can do but what we can not do” (2014). He continues:

While each of us can still choose not to be on Facebook, have a credit history or build a presence online, can we really afford not to do any of those things today? It was acceptable not to have a cellphone when most people didn’t have them; today, when almost everybody does and when our phone habits can even be used to assess whether we qualify for a loan, such acts of refusal border on the impossible (ibid).
In this quote, Morozov is connecting a number of topics from this and previous sessions. For example, the uptake of technological innovations is connected to record keeping, which is done by credit firms who help some people get loans but also restrict others. These record-keeping and decision-making processes are not necessarily transparent, nor is there a way to make those practices available.

This is where the issue of surveillance comes in. Recall the session’s critical thinking theme—possibilities for surveillance are an unavoidable by-product of standards and of keeping track of the effects of one's design. Someone can watch us by recording what we click online, purchase, or what websites we visit. Then companies can send stuff our way, but they can also treat us as if we are simply the same as anyone else who has clicked on the same sites, who has the same credit history. Not everyone in the same demographic category has the same attributes. (Ditto in the case in the mass-surveillance. People get treated as if they are all terrorists on the basis of their name, which may be similar to someone who might have been accused of being a terrorist.)

How do standards, record keeping, surveillance, and even privacy versus public good develop? The next example, from the article "A Critique of Stream Restoration Standards" (Lave, Doyle, and Robertson 2010), explores how standards developed in the field of environmental restoration. The environmental activism of the sixties and seventies led to many environmental regulations concerning land development. Some of that regulation says, in essence, "if you mess up ponds or water courses you have to fix them up." But what does “fix them up” mean? Dave Rosgen designed an approach, or a set of ways of fixing up a stream, that has become very widespread and standardized in stream restoration efforts. Contractors will not get hired until they are well-trained in his methods of restoration.

Rosgen’s standards did not come out of academic research sites on how streams can be effectively restored (which might be why Lave et al. are critiquing it). Because Rosgen’s methods can be taught as a standardized package, it can be used by agencies to justify decisions. As a consequence, agencies do not have to use their judgment or invest more of their own research time on a particular stream. Instead, the standards are just a means for everyone to say, "Now we know what to do. Now we know who to give the contract to—someone who knows the standards. We've done our job. We don't have to use judgment."

Rosgen’s approach has also become the basis of new markets in eco-system services, a means of valuing specific environments for their economic value. Once you put the value of
having an undisturbed stream or a restored stream into economic terms, it opens up (as we saw in the session on Spanning Distance) new markets, new commodity chains, and new ways of people getting involved and making a profit out of the services. While it is beyond the scope of this book to look at the ways standards were involved in the genesis of the Great Recession, the standards of what can be sliced and diced and packaged into the collateralized debt obligations or other debt packages that then get sold as part of this unavoidable by-product of standards and record keeping.

An oppositional form of record keeping is the use of “witness seminars” in the social history of environmental health (Sellers n.d.). Chris Sellers, an environmental historian, has been looking at industrial sites in the southern United States and the ways that these kinds of places have been exported internationally, such as to the Gulf Coast of Mexico. He uses witness seminars to bring

together 10-12 people with extended but very different perspectives on the history of an industrial site and its relations. In the course of the seminar, they discuss their recollections of this history, each from the standpoint of their own experience. One goal is for key members and representatives of different parts of a community to share their memories, recognize and discuss any conflicting recollections, and arrive at a better understanding if not a reconciliation of differences in what they remember (Sellers n.d.:1).

As a historian, witness seminars provide Sellers with a means of emphasizing memories as a record of the past. He states, “in this way, the witness seminars will bring back some results of our study to the communities themselves” (ibid). This is a positive experience. Although it is not necessarily the job of the historian, there is the hope that having brought these people together, sharing and reconciling some of their differences, they are more able to do something about the issues they face.

This is the same hope represented by Scorecard, though it is not highlighted as much in its current webpage. For example, the links to activist groups no longer seem visible. If not, why have they been omitted for the moment. Even then, Scorecard still provides the potential for a local activist group to identify exposed communities and people to focus their efforts. The witness seminars provide a way that people can be gathered together (a theme in the previous session) to map their intersecting processes from the personal to the wider context. It could
provide a way to begin to define multiple points of engagement that they could work on in collaboration together.

As with previous sessions in Design for Living Complexities, readers are encouraged to explore a preselected set of resources and develop design sketches based on a specific case: “Can health surveillance serve the community and the individual?” Scorecard uses official registries of chemical production to allow people to note their possible chemical exposures and decide how to respond. Some people might become activists, some might move, some might do nothing. Consider what might be possible—both intended and unintended—if each of us were able to keep track of our possible chemical exposures (using Scorecard), other environmental conditions and life circumstances, family health history, and possible genetic information. For this sketch, specify and explain standards you would propose for health-related surveillance. In other words, the sketch should try to get as possible to a level playing field in Frank's sense.

References


https://nyti.ms/1k5M02s Accessed on April 6, 2018.


Ontario Health Study. (2011). “Ontario Health Study 'About the Study' Video.”


As befits a last session, we might think about evaluation, in terms of improving by taking stock—from design to adoption and adoption by others. The overall critical thinking theme is making space to reflect using various tools or processes before proceeding either from one phase to another or on from an activity or event, makes it more difficult to simply continue along previous lines, opening up possibilities of alternative paths to proceed.

The session begins with Straus and Faud-Luke (2008) who work specifically in the design area of slow design principles. The first of their six principles they call *reveal*: “slow design reveals experiences in everyday life that are often missed or forgotten including the materials and processes that can be easily overlooked in an artifact’s existence or creation” (Straus and Faud Luke 2008, 3). This is a critical thinking theme. Slow design is concerned about raising alternatives—revealing experiences that are often missed or overlooked. It connects with the theme of session one, “byproducts are actually products.” Slow design is trying to look at the materials and processes that were overlooked in the artifact’s existence or creation—in the creation of the focal product.

The second theme of slow design is *expand*: “Slow design considers the real and potential expressions of artifacts and environments beyond their perceived functionalities, physical attributes and lifespans” (Straus and Faud Luke 2008, 4). That is similar to byproducts are products and is a critical thinking theme in itself. The third theme is *reflect*: “Slow design artifacts/environments/experience induce contemplation and what slowLab has coined reflective consumption” (Straus and Faud Luke 2008, 5). This contrasts somewhat with the lean startup approach, which had a certain fast feel to it, or fast design. In that approach, the effort was to get the prototype out there, get responses, and adjust (the term is pivot) if you find you have the wrong product. The emphasis was on getting a product that can make a profit for the firm or can be the basis of the firm taking off, and that the consumer in their initial responses is always right. You can see limits to lean startups to that fast design mode. For example, if you think about doing a survey of people in 2008 and asking, “Would you use a tablet computer?” They would say, “What's a tablet computer? Why would I need that?” For something that does not already exist, people do not know how to respond. The people who invented tablet computers may have
had many different ideas for its use, but they probably did not have all the ideas that people have come up with today, for example creating apps, etc.

The fourth principle of slow design is engage: “Slow design processes are open source and collaborative, relying on sharing, cooperation and transparency of information, so that designs may continue to evolve into the future” (Straus and Faud Luke 2008, 6). This principle is evident to some extent in the lean startup: the firm innovates and the audience pushes back, letting them know about the user experience that leads to more innovations. The principle of engage is in tune with the theme of gathering into community. It requires taking the time it takes—whether that is much slower depends on the group that is gathered into a community around the process. If you follow the principle of being open source and collaborative, you cannot push the process forward on your own inspiration or enthusiasm for the product.

The fifth principle is participate: “slow design encourages users to become active participants in the design process, embracing ideas of conviviality and exchange to foster social accountability and enhance communities” (Straus and Faud-Luke 2008, 6). Conviviality was the term used by Ivan Illich (1973), as discussed in the session on local particularity. Social accountability—in some sense that is what this final session is about—is taking stock. Social accountability is also evident in the strategic participatory planning and gathering into community that we have seen in previous sessions. It is not simply something you produced because you think it is a great idea and then you let it be in the world. A larger community can hold you to account, or to account for yourself—not hold you to account in some “pushing you against the wall” sense.

The last slow design principle is evolve: “slow design recognizes a richer experience can emerge from the dynamic maturation of artifacts, environments and systems over time. Looking beyond the needs and circumstances of the present slow designs are (behavioral) change agents” (Straus and Faud-Luke 2008, 7). I recall, for example, reading about electricity cords that would start to squirm after a while if the power to the computer was left on—even if it was just left on in sleep mode. The squirming cord was intended to change your behavior.

Straus and Faud-Luke work in a design field. They started the slowLab, and these are the principles they put into practice. It would be interesting to find out how these are related to the principles that have informed each of the twelve sessions of this course—and any other principles that emerged from the presentations and the design sketches—but that is for the future.
The slow design principles connect with the next theme: from reflective to redirective to refractive practice. Someone had created an image of reflective practice that involved a mirror. I said, “that’s not what reflective practice is about. We all know that reflection is something that happens in your in your head. You reflect.” I started think, “What’s the relationship between that reflect and the reflect of a mirror?” I had been thinking about that a little bit, on and off, when I heard a talk by Tony Fry and Cameron Tonkinwise, the people who we heard in a radio interview talking about the Urmadic Universities in session ten on intersecting processes (Funnell 2011). They talked about “redirective practice.” This sounded like a good term at first. Then I said that is too directional and too much like there is someone doing the redirection. Practice has been going this way and then it gets redirected to the “right” way. I just played a little bit in my head—perhaps I reflected—and realized that was going on in when we take stock is “refractive” (Figure 1).

![Figure 1: “Refractive Practice” by Peter Taylor.](https://pcrcr.files.wordpress.com/2012/10/refractivepractice2.jpg?w=630)

The line on the lower half of the figure is some kind of light ray going in one direction and hitting some material that has a rough surface. The light moves through the material; it is not clear which way it is going to move around and then it emerges at some angle to be determined. If this was a simple pane of glass, the light would come in, bend and then come out parallel to the way it had come in before.
Spending the time it takes before you move on to the next phase. This may be at the end of the morning of a workshop when you take stock before you adjust what you are doing in the afternoon. It might be with a severe illness in a family—or a severe illness for oneself—which does not allow you to “simply continue along previous lines” (Taylor 2012). There are other things which are not a benefit of being severely ill, but this is a benefit. You get this opportunity—this period—to be refracted and then come out in some other directions.

We are familiar with being involved in, for example: the workshop finishes, the organizers take some time to read people's 1-5 evaluations (a typical form of getting feedback. A more refractive alternative is to use a critical incident questionnaire, which can be filled out in the last five minutes (Taylor and Szteiter 2002, 65-66). The session leader compiles the responses of a session into a form that can be shared back with the participants. The critical incident questionnaire is quite short, so no one person can convey everything they have thought about the workshop, the course or seminar series. The process of collation takes quite some time and allows the person who is reading to really take in all these pieces. Always a huge diversity of responses are received—too much to put in a simple summary. The typical approach I use as a compiler of critical incident questionnaires is to notice, for example, when two people's responses have been diametrically opposite. They do not cancel out; instead it shows that in this gathering you had people who were hearing or experiencing it in quite different ways. You have to think about how in the future you can accommodate the fact that you will be heard in different ways.

Other modes of refraction may be a space of dialogue with others. You are being observant. You have been thinking a lot, but when you hear how other people have been thinking, you realize your way is not the only way of seeing what has been happening.

Other refractive practice tools include:

- “Freewriting to bring thoughts and feelings to the surface of attention and clarify them” (Taylor 2012), which we have used often in the course.
- Supportive listening (Taylor 2012). In supportive listening people split the time they have available and just attentively listen to the other person.
- Plus-delta evaluations, which provides a set of items that you want to improve on. At the end of session (for example, a class you taught) you take the time to go through those five or six items and for each state, “What did I do well? What could I develop further?” By making
plus-delta a routine, you can keep yourself moving along. Some things that were identified as
deltas early in a period might become pluses.

You might add items to the list and cut out some when you have them going very well.

Taking stock when it is seen as simply “we must evaluate” is a ritual, sometimes a tired
ritual, not a very sincere ritual. The instructor or session leader is just relieved if they get
moderate to good evaluations. I want to suggest that whether it is refractive practice or some
other way of taking stock, it’s an ethical imperative to do it seriously, that is, with the goal of
improving. (Taylor 2013a).

What is behind this idea of taking stock as an ethical imperative? First, let us flesh out
taking stock. It is basically the image of refractive practice—"making space to reflect using
various tools or processes before proceeding either from one phase to another or on from an
activity or event” (Taylor 2013). What makes this ethical?

1. If a person takes stock as a routine, given that any path will have been chosen in tension with
alternatives, they will end up less likely to look back with regret on a path they persisted. In
that previous diagram with the question marks you'll be more likely to be have been able to
shift from one alternative to another. It is an ethical imperative in terms of looking after
yourself well.

2. If a group takes stock so that everyone’s voice gets raised and acknowledged, then, even
when the group decides to move along a certain path, doing so will be less like a workhorse
with its blinkers on and more like someone who can look left and right to remind themselves
of the wider context and tensions even as they move along that path (Taylor 2013a). They
will be able to see the other paths and maybe even bring them into any discussion taking
stock of the path they are on.

a. In that group sense and in conjunction with the first theme of being less likely to look
back with regret about having persisted the group theme allows “a participant [to clarify]
whether they are in the group wholeheartedly or on what terms. Participants may realize
that the group’s path is one in which they no longer feel creative or hope-full” (Taylor
2013a).

3. Conveners of groups are asking people for commitments of time. Acknowledgement of that
request should commit the convener into showing whether the goals of convening the group
have been met. Of course, taking stock of whether the goals were being met requires that the
goal need to be defined and made explicit beforehand. In that spirit, for many years I have
tried to follow the principle of not going to a meeting where the agenda is not explicit. If I am told I have a meeting at ten o'clock on Tuesday with the Dean, but the dean has not told me why we are meeting, I will just politely say I am not able to come. Sometimes being polite does not lead to polite responses, but many of us have experiences that when we go to such a meeting, we get ambushed. We have not had time to prepare or to bring allies.

4. “Convenors of some experimental group process”—or experimental courses like this—“are not only asking for person-hours of time, but are asking for participants to learn something new. [Therefore] they should build in taking stock to show that they too are prepared to learn so as to improve” (Taylor 2013a). As a bonus on this last idea,

a. As an extension of this, “building taking stock into experimental group process encourages participants to convene their own experiments” (Taylor 2013a).

What makes these ethical principles? There are a variety of responses. By making it more likely that other people experiment it says, “experimenting is ethical.” The idea that we can improve our social interactions is a positive design idea. Evaluation or taking stock becomes an ethical principle to the extent that it makes it more likely that we will make improvements. In these posts I go on to write, “the ethics of all this seems easier to articulate negatively: If a person does not do #1, it is more likely that they will end up regretful…. If a group does not do #2, it is more likely that some member will feel coerced by the path chosen. If a group convener does not do #3, it is more likely that they will end up having wasted people’s time” (Taylor 2013a).

Ironically, the first two negative aspects of the ethics were not the original motivations for thinking about taking stock as an ethical imperative. The motivation was about having had my time wasted by people who convened groups without articulating the goals or evaluating whether they were met so they could improve the next time. When it comes to experimental processes, the same occurs. If taking stock is not built in, you might end up having wasted people's time. In particular, people may feel toyed with.

Thinking about these negative aspects—what happens when you don't follow these reasons to take stock—"leads to a sense that the positive ethic in taking stock is respect. Respect for: internal personal heterogeneity (#1); heterogeneity within a group (#2); time devoted to the group (#3 & #4); and everyone as learners (#1, #2a, #4a). This last item points to the need for group support for a person to learn through trying out something new (#4). That support can be
more readily given if participants in the experimental process know that there will be stock taking” (Taylor 2013a).

Putting it all together as a whole gives us a critical thinking theme: taking stock is not just a routine, a ritual, or something that we need because we have to get data; it is an ethical imperative.

The next item is not an ethical impulse but says “please, I need support and I need my time not to be wasted in a hierarchical institution.” This is the issue of evaluation of academic leaders, for example, the deans, provost, presidents, chancellors, and so on, which often happen at three year or five-year intervals. Many surveys are done, maybe focus group meetings, maybe private interviews, when the review committee allows you to talk to them. Sometimes you hear back from the committee that this person sailed through. Sometimes you hear back from the grapevine that this person is being given a year to find another job. Sometimes you never hear back, so the person just continues in their job. That does not allow much opportunity for learning by people like myself who contributed their time and ideas. It also does not contribute much to idea that the academic leader is also learning. Nor do you get a sense that the institution is committed to evaluating in a way that allows people to improve by learning. You might just get a sense that they are relieved that they have another five years. What would be an alternative approach to this?

The blog post “Evaluation of Academic Leaders” (Taylor 2013b) suggests that the responsibilities of the academic leader include leading in such a way that they do not need to be evaluated at three or five-year intervals, or that that evaluation at three to five-year intervals is not the decisive part of their leadership:

Members of an academic unit (e.g., a College) should look for a senior academic leader (e.g., a Dean) who makes multi-yearly evaluations hardly necessary. A genuine leader makes explicit their own objectives with respect to operations of the Unit, takes stock continuously of what is working well and what needs improvement, and reports regularly to the Unit on progress on each of these objectives.

“Operations” does not mean here the high-profile issues such as grants received by the Unit or new partnerships. It means the range of everyday and recurrent practices that support members of the Unit to do the best work they can under the always-constrained circumstances, allowing faculty members in particular to preserve a balance between
research & writing, service & institutional development, … teaching & mentoring” and work and family and other life commitments. (Taylor 2013b).

“Whether the current leader continues after the review or a new leader is found, we should not be unsure of what his/her objectives are after three months, let alone by the time the multi-year evaluation takes place” (Taylor 2013b). Implicit in this notion of a genuine leader making multi-year evaluations unnecessary is the idea that the leader’s job (notice the word leader here) is one that sees their goal as “support[ing] the faculty well, especially the work of faculty to serve students” (Taylor 2013). The post goes on to suggest ways in which that gets implemented in practices that happen every day or week, rather than at this three- or five-year interval.

This approach also suggests that evaluation has more goals than simply giving thumbs up or thumbs down (or thumbs sideways, meaning you can stay for another year but find another job). It corresponds to a model of evaluation that says there are four goals:

1. To inform decisions by superiors about whether to continue the leader’s appointment and, if so, what guidance or expectations to attach to the re-appointment;
2. For the evaluated person to identify ways to improve;
3. For the evaluators to clarify what they have learned from interacting with the evaluated leader about the ways that they want to interact with academic leaders, whether that refers not only to the current Unit leader, but to a leader of a unit at any level.
4. To inform institutional learning about how faculty and the leader’s superiors can get the most from interacting with the current Unit leaders or any other leader and from evaluating leaders (Taylor 2013b).

Although real-world leaders are mortal, these principles are not simply idealistic. They are practical. I am suggesting how we can get the best out of working with whoever we happen to have in this role at this time.

The last item is critical thinking as a journey. The course has been about critical thinking about design where critical thinking is construed as holding practices or ideas in tension with alternatives. One of the areas that we could hold something in tension with alternatives is the notion of critical thinking, which is usually about being sharp or critical. Do you have the evidence? Is your logic or reasoning tight? Have you questioned your assumptions? An alternative image would be that critical thinking is more like a journey in which people are
uncertain about what will happen. They have more experiences then they can really take in, and often they will need support. They need to return home at least for a while before they can really digest what happened. A journey involves risks; associated with risks is fear. The sense of critical thinking is very different from the conventional, more philosophical one. Where did the notion of critical thinking as a journey come from? Taylor (2008) presents five episodes in my own development as a teacher or mentor and one of them led me to this alternative metaphor.

If you read the passages from Taylor (2008), some of them will be quite familiar for anyone who has been following through what I have written about the sessions in this course. I have tried to write about the sessions and end with open questions, which was to say that, in essence, “I'm not trying to give you, the reader, the definitive account of critical thinking.” I am trying to stimulate you in the spirit that “we know more than we are at first prepared to acknowledge.” I am trying to give the reader a chance to bring up their own knowledge to the surface and do something with that in response—or bouncing off or refracting through—reading the five episodes. Of course, even though I tried to create the sense as you read that there were open questions, I got to talk first. It was my text that was defining this conversation. Conversation may not even be the right word—potential conversation. Admitting this, I allowed myself to be didactic in the coda of the essay to summarize the challenges that I see for a teacher as a facilitator.

Let me take them in turn and apply them to this design course, starting with the overall theme of the essay. The “central challenge addressed in the essay is that of helping people make knowledge and practice from insights and experience that they are not prepared, at first, to acknowledge” (Taylor 2008).

This course gives many opportunities for the individual to bring to the surface what is important, to acknowledge or to choose among alternative paths, or to explore other paths through these design sketches. These challenges are “be sure the room has chalk for the chalkboard before we started a class.” They are ones which will require interaction with the particular group of people and taking stock of oneself—what worked well and what could be developed further.

a. Help students to generate questions about issues they were not aware they faced. That certainly been the motivation for the design of this course on critical thinking about design.
b. Acknowledge and mobilize the diversity inherent in any group, including the diversity of mental, emotional, situational, and relational factors that people identify as making re-seeing possible. *Re-seeing in this sense is critical thinking, seeing things in relationship to alternatives, seeing things that you had not at first being prepared to acknowledge. For this course, we have tried to do this by having cases that allow each participant to pull it in directions that interest them, and then to see what emerges. In another sense the pre-prepared presentations have steamrolled a bit over slower interactive portions of mobilizing diversity. How (for example) can the critical thinking theme for session nine be presented to the audience without really finding out very much about who they are and the diversity of ways they're hearing or mis-hearing what the presentation is saying in a muddled or sometimes clear way?*

c. Help students clear mental space so that thoughts about an issue in question can emerge that had been below the surface of their attention. *In the first two sessions I deliberately stopped and modeled free writing. I hope that the audience gets the idea and stops reading to freewrite along the way. I do not tell participants to do that. I expect you to do that. You can decide whether I should have been explicit.*

d. Teach students to listen well. (Listening well seemed to help students tease out alternative views. Without alternatives in mind scrutiny of one's own evidence, assumptions and logic, or of those of others is difficult to motivate or carry out; see also point i, below. Being listened to, in turn, seems to help students access their intelligence—to bring to the surface, reevaluate, and articulate things they already know in some sense.) *It is hard in an online to teach anyone to listen well. You cannot model it because you are talking and presenting, not listening. Those are part of the limitations of conventional online learning and makes a challenge to be taken up. If we want to promote critical thinking, how can we bring in the listening well aspect?*

e. Support students on their journeys into unfamiliar or unknown areas. (Support is needed because these journeys involve risk, open up questions, create more experiences than can be integrated at first sight, and yield personal change.) *We see here a few more aspects of the metaphor of critical thinking as a journey. The way the instructor of this course supports students on their journeys is to pose cases that allow students to pull them in directions that are interesting to them and move beyond what they have already been doing. After a short time you*
come back with your design sketch, then we respond to the design sketches. The journey becomes interactive.

f. Encourage students to initiative in and through relationships, which can be thought of in terms of themes that are in some tension with each other: "negotiate power/standards," "horizontal community," "develop autonomy," "acknowledge affect," "be here now," and "explore difference." Try it out. Don't simply say, “Well this is going to be useful to me?” before you try it out. Explore or embrace difference.

g. Address fear felt by students and by oneself as their teacher. This is left unexplored for the most part.

h. Have confidence and patience that students will become more invested in the process and the outcomes when insights emerge from themselves. That certainly informs the idea of design sketches.

i. Raise alternatives. (Critical thinking depends on inquiry being informed by a strong sense of how things could be otherwise. People understand things better when they have placed established facts, theories, and practices in tension with alternatives.) Obviously, that is the central theme of the whole course.

j. Introduce and motivate opening up heuristics [themes], that is, propositions that are simple to convey, but always point to the greater complexity of particular cases and to further work needed to study those cases. The session where that was most evident was in the intersecting processes—the case where I use the Brown and Harris account of the higher incidence of depression among working class women in that area of London in the late 1960s (Bowlby 2012). In that I was pointing to multiple points of engagement and how to get involved in those multiple points to then link with other points of engagement. This is a theme that I think I could motivate but if you are doing it in any particular case there would be all the complexity of that case, which would include the complexity of one's own sense of oneself and what one has to do at that time and what one is able to do. There are some other opening up themes that I use in teaching and have
not used so much in this course. Now I would need to think about why I have not used opening up themes so much.

k. Be patient and persistent about students taking up the alternatives, opening up heuristics, and other tools and applying them to open up questions in other areas. (Experiment and experience are needed for students to build up a set of tools that work for them.) It would be interesting to look back at some time after this course to see which of the twelve critical thinking themes people remember, are still thinking about, and maybe even a putting into practice.

l. Take seriously the creativity and capacity-building that seems to follow from well-facilitated participation, while still allowing space for researchers to insert the "translocal," that is, their analysis of changes that arise beyond the local region or at a larger scale than the local. I tried to convey that when I spoke of the strategic participatory planning that went on in the West Nipissing region of northern Ontario. This course clearly has not been about well-facilitated participation in some community or group planning process. It has been more conventional: trying to convey ideas and get people to take them up. It has promoted well-facilitated participation, but it has not walked that talk. It has brought up critical thinking themes about design that could be inserted, be informing, be chewed upon, by the well-facilitated participants in any local situation. That is the overall hope of the course.

I am looking forward to following through—doing the cases myself, responding to any design sketches that emerge, looking back at the presentations, and imagining that the course could be done a second time, but without huge amounts of new investment of time and resources. I have modeled that a person can create, run a course, and then also use that to motivate a collaborative exploration (an open-access involvement in the course in a small group that gets to know each other). The course can also be part a MOOC, completely open access and open to people who are dipping in when they want. Although I feel quite good about these features at this point, there is a little fear as I look forward to a time when people give feedback (for example, some feedback might be “I couldn't keep listening when there was background noises in the recording” or “when things didn't work well or when I had to click out and go and click on and look at the copyright protected videos my myself separately—that was too complicated”). There are many potential places where what I think it is part of a MOOC that is doable and accessible.
but does not require the huge infrastructure or the Udacity or Ed-x to make happen. I thank anyone who has been participating through to this final session of this first version of design for living complexities.

To be continued….

References


Appendix A: A compendium of design concepts

I
cludes topics beyond what could be covered in a twelve session course. As readers explore this compendium, think about what items are included and whether they convey or correspond to a design principle, especially a principle of critical thinking.

Affordance
Apprenticeship
Borrowing
Communicating
Conventions
Craftivism, including feminist critiques of undervaluation of craft by women
Defense
Divisions
Engines
Gadgets
Gears
Information
Literacy
Material properties
Moving
Public Health
Purity
Reactivity
Recursion
Reproduction of images
Resilience

See also: