Navigating complexity and tackling wicked 21st century problems: The case for design capabilities (Draft, not for circulation)

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Complexity and social innovation stream

Laura Murphy, PhD
Tulane University
lmurphy2@tulane.edu
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Abstract

The 19th Century "Planning Paradigm" of blueprints and best practices is outdated in the face of global, interconnected, wicked problems like climate change, refugee movements, chronic poverty, financial crises, and more in the 21st Century. We need to adopt a flexible "prototyping paradigm" (Hassan, 2014) where we inch forward with modest, lower-cost, eco-aware, and intentional small experiments. For this, we need to expand our "**design capabilities**"—our abilities to empower ourselves --and others--to be more creative, adaptable, and confident in seeing and navigating these wicked problem landscapes. Starting wherever we are, we can envision better futures and take steps to create them. I introduce a trans disciplinary theoretical framing for design capabilities as part of a system-aware approach to societal problem solving. I draw from three main strands of (1) critical development studies in international aid calling for a **complexity worldview,** acknowledging our interconnections, feedback loops, nonlinear change processes and emergence (Ramalingan, 2012); (2) the **capabilities approach**, the mainstream normative framing for human development action as "expanding freedoms to do more and be more, in ways we have reason to value" (Sen, 1999) and (3) the principles and practices of **design thinking** for social impact and changemaking (Murphy, et al 2017; Brown and Wyatt, 2010). The concept of **"design capabilities"** lies at the center of these fields of seeing, valuing and doing. These design capabilities are needed to help us embrace complexity, engage and define problems, and shape the future. Examples are given of how this approach guides responses to climate change and food deserts. I write as a field researcher, scholar, trainer, and educator working in New Orleans, Kenya and other settings on themes of livelihoods, food systems, technology change, and the environment. I am looking for better models to offer students seeking pathways in social innovation.

Keywords: complexity, complex systems, capabilities approach, design thinking, diffuse design, wicked problems, social innovation, social entrepreneurship, changemaking

Part I. Observations. The nature of the problem landscape we face

Our 21st Century problems. The world and our challenges are more complex than ever. We face ever more dynamic, interconnected, and unpredictable realities.

Recognition of our situation is necessary before proceeding:

We look out on a landscape characterized by increasing interconnectedness, incertitude, non-linear change processes A few vignettes, personal and professional, from around the world capture the daily reality of our problem landscape (see figure 1).

Figure 1: Our Problem Landscape

By 1997, I had completed my dissertation research on deforestation in the Ecuadorian Amazon, using regression models based on standard assumptions to explore determinants of land use. Yet already by 2000, a vast, rethinking of processes of deforestation, soil formation (as Terra Preta), and land use have changed our understanding of causes and implications of forest growth, composition and loss. Historical understanding and broader perspectives are needed. Society is always learning.

August 2005, a hurricane passes by the city of New Orleans, but the powerful Gulf storm surge undermines floodwalls in specific neighborhoods--each breach happening in its own way—with massive flooding leading to months of displacement and hardship and a long recovery. Incertitudes abound and small things matter in big ways.

August, 2017, Southern Texas is inundated by Hurricane Harvey waters that spread over hundreds of miles of floodplains inhabited by suburbanites; Puerto Rico is devastated by Maria and the power remains out and the island in desperate straits. Tipping points are passed and new regimes established.

The Anthropocene is upon us (Hamilton, 2017). We are experiencing a total rupture in earth systems, a non-linear shift to a new regime of a warming earth. The responsibility for humankind is clear, yet political pundits can still shape public opinion and suggest there is a reasonable denial of science. We have an overwhelming sense of paralysis.

Wicked Problems

What we face are ever more "wicked" problems (see Figure 2: Wicked Problems). An individual facing these "wicked" problems notices complex issues characterized by high levels of ambiguity (different perspectives on the problem), unpredictability and ignorance (or non-knowledge). (Rittel and Weber, 1973, Ramalingam, 2015). Other forms of "incertitude" are involved: uncertainty, calculable risk, and ignorance. The problem is ill defined; there is disagreement about reasonable actions. There are many drivers of change and many institutions involved. The system itself has unclear boundaries.

Figure 2: Wicked Problems

The phenomena of speedy, multi-faceted globalization, interconnectedness of social, economic, values and production systems and environmental change are our new reality. Global financial crises, e.g., 2008, caused by accumulation of high-risk debt in MBS and speculation in SE Asian markets diffusing out to become crises of default, job-loss, and hardship (for many, and bonuses for others). Power in diffuse forms is inherent in and not separate from otherwise "technical" problems, leading to a "development apparatus" that works like an "Anti-Politics Machine" in international development, such as the rural development schemes in highland Lesotho in the 1970s and 1980s (Ferguson, 1990).

The "wicked" nature of these types of problems means we have surpassed the limits of our ability to rationally gather data, analyze, communicate, and act with clarity, especially given our disciplinary blinders and the contentious nature of our social and political systems. Elections, representatives, legislators show the influence of wealth and privilege, biasing against others on the basis of race, gender, religion, and class. We see thus the failure of advanced societies to connect and notice, much less address these complex, global problems. We see that conventional approaches to social problem solving --dating to our 19th Century industrial, time-saving, techno-centric, and productivity focused management and policy analysis—will not work. Machine metaphors proliferate and language of levers, gears, log-frames, and "best practices". In this case and time period, ever more data and more rigorous statistical analysis using flawed and inappropriate assumptions will not bring truth or clear answers.

II. Principles: How the world really works and how change happens

We need frameworks to help us navigate the new landscape. A complexity worldview, an ecosystem approach to change, and a prototyping paradigm.

These technocratic problem-solving approaches in policy and public domains will not suffice to understand the world and inform solutions. We need to "embrace complexity" and use an ecosystem approach. This refers to the scientific paradigm of complexity, an epistemological framework for knowledge (Quinn-Patton, 2010), as well as a worldview and a metaphor to guide behaviors and promote change via "prototyping" paradigm(Hassan, 2014), not rational, formal planning.

These frameworks help us understand how the world really works.

see Figure 3: Ecosystem thinking

As a scientific paradigm, ecosystem thinking is grounded in complexity science, computer science, ecological research in the natural, physical, environmental, biological, and computer sciences (see Fritjof Capra, Eric Berlow, John Holland, and many others). Systems thinking recognizes behaviors and phenomena in terms of a (more or less clear and bounded) system with boundaries, elements, and interconnections between them.

Systems may be simple, complicated, requiring different kinds of actions to resolve or muddle through them, from a recipe to substantial technical knowledgeon one hand (simple, complicated), to tacit feeling-ones-way through an unclear path (complicated). These might be visible and "hard" systems to be revealed through data visualization and scenarios; or they might be socially constructed and "soft" systems, a metaphor for how we are connected, to guide leadership, organizational change, etc. Both of these approaches are relevant for thinking about wicked problems in the world.

Complexity is not just "complicated" but an emergent property of the kinds systems we see more of--with many agents that are interconnected and interdependent, influenced by feedback loops, co-evolving over time, exhibiting possible non-linear behaviors. These can amplify factors and leading to tipping points.

Ecosystem-thinking is used in popular practice to refer to **a living and learning community** and relationships among different people, resources, and sub-systems (teams, organizations) in different sectors that support social change efforts in a mutually-beneficial way. The term eco-systems reflects that the system has living properties and qualities, like actual ecosystems. It can thrive with appropriate energy, nutrients, and waste cycles/management. Diversity is a valued property of natural systems, and particularly coral reefs and tropical forests. Like natural ecosystems; our socio-technical and political systems grows, learn, evolve, and adapt.

To work, an ecosystem needs cultivation, new seeds can bring diversity, and relationships need support and nourishment. It's not a machine. It is similar to the permaculture approach in agriculture and habitats, and a circular economy way of thinking around production systems. Recognizing this living, networked quality of the system allows for growth and unpredictable change. It can be used to promote resilience of a system.

> For example, after Hurricane Katrina and the levee failures led to the flood of 2005, many new actors moved to the city and helped in rebuilding as short term volunteers or on longer term service. This evidently gave many young people a meaningful life. This grew into a New Orleans "social entrepreneurship ecosystem" that involves social entrepreneurs, charter schools, small

social businesses, urban agriculture, workforce development, new government agencies, universities tied to service learning and change-making, and philanthropic actors --all learning and growing together.

Ecosystem framing for research and understanding can help understand and explain the persistence of international development aid programs over decades despite their non-success in addressing the stated social problems of poverty, unemployment, disease, etc. There are unrevealed relationships and hidden assumptions about what is really going on with this ecosystem of actors, whether organizations or individuals, that seed, nourish and sustain unintended consequences (the instrument effects, after Foucault).

As an example: In a highland Lesotho region, anthropologist James Ferguson (1990) revealed how project funding and resources hired employees, developed projects, built buildings and roads, and indirectly supported local political parties. These did not directly address poverty, but enabled these schemes to continue nevertheless. More recent examples are the large apparatuses guiding HIV/Aids responses and shaping aspirations of rural Malawians (e.g., Watkins and Swidler, 2012; Swidler and Watkins, 2017)

The health ecosystem of a community would similarly reveal a range of actors--governmental, private sector, public community-based, faith-based, NGO, donors, technical experts, various United Nations agencies, traditional healers, community health workers, etc. There are flows of funding, ideas, and accountability checks within this (as well as pathogens ad other adapting living creatures). The living "ecosystem" might not actually work the way we hope it does from a blueprint-- it works because the ecosystem responds to the flows of nutrients, information, etc. A country health system reliant on external aid can end up formally reporting to and responding to the demands of a third party external government and UN agencies, possibly to the detriment of the citizens health and a resilient, self-sufficient system.

A prototyping paradigm vs. a conventional planning paradigm

Another useful guiding principle is to operate with a prototyping spirit. The 19th C "Planning Paradigm" of blueprints and best practices (what I learned in 20th C planning graduate school) is outdated now in the face of global, interconnected, "wicked" problems. These linear planning approaches (grounded in Newtonian Physics) demand exhaustive "hard" data, extended implementation, and belated evaluation. They can lead to over-analysis and paralysis.

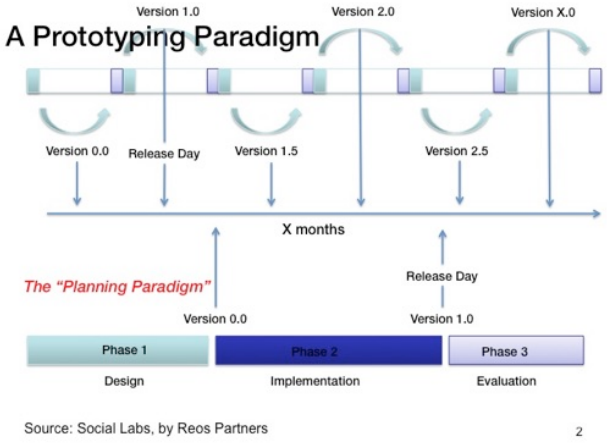


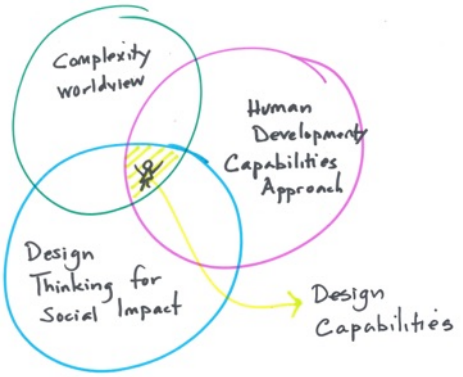
Figure 4: Prototyping vs. Planning paradigm.

A *prototyping paradigm (*Hassan, 2014*)* is another way of putting something new out there in the world--a piece of software, a new experience, a new product for a market. The idea is get more iterations of ideas out for feedback faster in the same time frame as conventional planning. The figure 4 shows the

non-linear iterations above, with feedback loops as arrows; in relation to the conventional linear planning paradigm below.) Find what does not work faster. Get feedback on specific aspects and with different user groups to iterate another version. Beta software gets out in the world quickly so that actual users can send feedback to improve it.

The normative Capabilities Approach plus design thinking lead to design capabilities, introduced below, Coupled with an ecosystem approach (and with other dialogue methods in Social Labs), support this prototyping spirit.

Part II. Principles: We are all involved, we are all designers, and we need more changemaking skills



More constructive, creative, agent-based ways to work together are needed. The normative Capabilities Approach and freedoms. Characteristics of design "thinking". The Design Capabilities concept.

Our truly complex (not just complicated) social, technical, political, economic, ecological "ecosystems" call for more intelligent, adaptive, diffuse, agent-based action and for more prototyping approaches. They don't need more attempts at bureaucratic control (recipes, or technical procedures) which stifle creativity and agency. I argue for developing our **design capabilities** to help address these problems. Theseconceptually lie at the intersection of complexity, capabilities, and design. These capture, respectively, our 1) worldview, as an epistemological and ontological stance; a 2) normative or evaluative space of "capabilities"; and 3) design thinking/attitudes, as a deeply human way of thinking, acting/being, and doing. Figure 5 shows a Venn diagram representing this intersection.

Figure 5: Design Capabilities at the Intersection of Complexity, Capabilities and Design

The capabilities approach is a foundation for this concept of design capabilities, the set of interconnected, universally relevant human abilities or capacities that are needed for addressing wicked problems. Insights and experiences from design thinking movement, particularly human-centered design for social purposes contribute elements and motivations. I view designing as a fundamentally human practice. The ability to design requires we can imagine, learn about, and craft a new and relevant experience, device, service, etc.

The Capabilities Approach (Human Development)

The "capabilities approach" (CA for short) or human development is a philosophical school of thought on pathways to social progress that aims for universal relevance. The purpose of development efforts, aid and social policies is not economic growth and instrumental uses of people for other ends, but to "enhance freedoms" of all people to "do more, and be more in ways that they have reason to value." (Sen, 1999; UNDP 1990; Nussbaum, 2000).

This approach is universally applicable, historically grounded, and inter-related to human rights. It is widely used in practice and expanded through practitioners and scholarship (e.g., HDCA.org).

Three key concepts are capabilities, functionings, and agency. Capabilities (what we are potentially able to do and be, thanks to our place of birth, time in history, social and genetic birthright, etc.) are distinguished from Functionings (the things we actually, individually choose to do and be, given our capability set).

> As an example, consider two individuals with the same low body-mass indicators (BMI). One is a refugee, whose capability to be well nourished is outside her control. Another is on a hunger strike, and she chooses to make a political statement that is under her control, exercising her reason and agency.

The expansion of individual agency, or the ability of an individual to act, is central. It is not the BMI that is an adequate and unbiased measure of development status, but the underlying capabilities: i.e., to be well nourished, to choose health over political action, to make reasoned decisions.

The basic capability set includes the range of positive "freedoms" to do and be that we believe are part of what makes any human life meaningful. The founder of this field, Amartya Sen, declined to specify or name these capabilities, leaving it rather vague and up to other countries, societies, and communities to decipher. Other scholars have advanced frameworks that help identify and name specific capabilities to promote their use.

The Human Development Index (HDI) maintained by the United Nations Development Programme (UNDP) reflects one well-known application at a national and global level. The index captures the capabilities of life and bodily integrity, access to material goods, and knowledge (in an aggregate, weighted measure drawing from national level indicators for each component). One of Sen's goals was to identify a better "evaluative space" for social policies than GDP or other economic measures. Poverty is not a lack of income, but deprivations of capabilities or valued freedoms. In that sense, this approach has elements in common with other alternative measures of policies, such as the happiness index.

Recent social innovation research utilizes this approach to assess outcomes for marginalized peoples of specific social innovations. The capabilities approach informs attention to agency and how local communities can be involved in social transformations. We should "include marginalized groups in the policy design and implementation processes, thereby incorporating from the outset the 'doings' and 'beings' they value" (von Jacobi, Edmiston and Ziegler, 2017). Tiwari (2017), in looking at self-help groups, explores how self-help groups and co-operatives offer answers to questions such as (asked by the special volume's editors): "How to take the perception and values of people as agents seriously in social change process? How to liberate the creative and emancipatory potential of an innovation process that is not only outcome-focused?" In this same issue, Matthews (2017) argues for the respect and support for local, creative responses—the "innovation processes originating in marginalized communities themselves." These applications of the CA appear consistent with a spread of the concept of "design capabilities" as an intentional appreciation for designerly qualities within the capability set.

This capabilities approach offers ways of thinking about universally applicable human values and "evaluative space" of capabilities. These are not just for our "beneficiaries" of projects in the developing world, but also to assess progress of policies and social actions in conventional wealthier societies, such

as the USA, where many deprivations are seen of capabilities of bodily integrity, agency, affiliation, and play, to name a few (Sen, 1999).

This is a strong foundation for considering the necessary capabilities for cultivating world citizens who are able to make change in the face of intimidating wicked problems, i.e., the more effective, creative, action-oriented, empathetic and inspired changemakers we seek.

Design Thinking, or human-centered design (HCD) refers to a structured process of intentionally surfacing solutions to problems—of creating new value for people ("users") of systems. It's seen as an innovation process and as a way to generate solutions to "complex" problems, those that are partially known and ambiguous, and intersecting social, technological, political, organizational, and environmental issues and actors (Brown and Wyatt, 2010). Design thinking evolved out of professional fields of product design, public-interest architecture, service design and other design fields. HCD is also known as "design thinking" by one proponent and founder of IDEO and d.school at Stanford (David Kelley, 201X); he emphasizes that it is ways of "thinking" about people as our users; empathizing with them and their problems rather than seeing design as just making or inventing products. Long ago, Buchanan (1992) argued that design thinking is a way to solve complex problems and thus comprise sa "liberal art of technological culture," relevant for many people; but this conception-- phrased long before the digital technology driven information revolution—seems to have been displaced by the narrower, social impact design trend led by the Stanford d.school and IDEO.com and IDEO.org.

A few key characteristics bolded below help convey what this means as a practice.

Design thinking is a set of mindsets, processes, and principles for designing for people. The focus on humans means a focus on the intended **users**. The term refers to end-users of design systems, and the audience or purpose of the design challenge and solutions arising from it. As a process, it is **iterative**, as initial design research and feedback shapes this big problem into narrower "challenges" that highlight insights,refine problems, clarify users, and inspire new thinking through "yes, and" brainstorming and idea-generation. Designers tend to ask: "**How might we...?"** (not "why don't we?" or "We should") which is a particular marker of an optimistic and open-ended design-thinking lens. Designers explore and seek understanding and solutions using rapid ethnographic and exploratory design research, **rapid prototyping, iterations**, with a "bias to action" and "let's try it out' mentality, with some testing with intended users (real and stand-ins). Often, the problem as presented is not the one that needs to be fixed or not one that can be addressed directly; so **reframing of problems** is needed. It's a **compressed timeline**: This design-thinking process can take weeks or months in a professional or real-life setting (IDEO.org, Vechakul, et al 2016). It could require days or just a few hours for personal or small workplace based challenges. All these features are wrapped into **modes and mindsets** and frameworks and princples to guide our attention, like *"inspiration, ideation, and implementation," and " Hear, Create, Deliver"* (IDEO 2015), *Empathy, define, ideate, prototype, and test* (from the Stanford d. school—they evidently recently added "accept") and others. *Discover, Dream, Do* is another **framework** for this process developed by Taylor Center curriculum designers (Murphy et al 2017a). (These frameworks all have value; any can suffice if used and adapted appropriately)

Social impact design, design thinking for social good, and other related movements are arising and spreading (again! See footnote, this is related to the intermediate and appropriate technology (IT/AT) movements in 1970s. Free and paid courses, online learning platforms (such as +Acumen), new job positions, projects, and practices help diffuse design thinking for social impact and social innovation. These professional frameworks and methods are being made accessible to many more people around

the world. This is probably spreading agency, design skills and constructive action in organizations such as international development NGOs, UK charities, UK Policy arenas, the US Government office of Personnel Management, major foundations, and more (though research is needed to understand the details of who, what, and how.)

Going further, outside professionals in organizations, designing can be seen as a fundamental human activity that should be accessible to more people around the world, like other human rights that we recognize. Societal challenges call for us to spread design "thinking" beyond the domain of professional expertise for hire (in design and development organizations), but as part of a basic capability set for all.

Diffuse design, a concept proposed by Ezio Manzini (2014, 2015) is one clear effort to articulate a value and approach to design by and with everyone for the common good and for a flourishing society. In his work, there is a role for expert designers and a role for lay designers, in developing social (public) innovations, for example, the Slow Food Movement. We need to diffuse and cultivate design "capabilities" among the public. What might that mean? How do we develop these lay designers? A deeper, philosophical grounding for this diffuse design practice is possible.

Design Capabilities is the notion I introduce and argue for. It involves expanding and enriching the standard capability set suggested by Amartya Sen (1999), and further developed by Martha Nussbaum (200x) The aim is to reinforce, expand and promote valued freedoms to create, make, understand, and reframe problems—to enable a person to participate more meaningfully in designing the world around him/her and in collaboration with others. The concept of design capabilities blends into this capabilities approach the benefits of design –particularly the deeply empathetic, human-centered design fields principles, structures, ways of organizing resources, time, energies, and an artisanal, craft approach. Below is an initial sketch of these design capabilities we need to cultivate. See Figure 6: Some Design Capabilities, below.

These will help us develop the lay designers, engaged citizens, and creative changemakers who are better equipped to navigate complexity and-to generate social innovations that address wicked problems. These design capabilities reflect cross-cutting aspects of Nussbaum's list of ten central capabilities. (Note: This work is being elaborated further in another manuscript (Murphy, 2017b).

Initial List of Design Capabilities (cross-cutting, drawing from Nussbaum's 10 central capabilities)

- **Start Here (where you are)**
    - Enriching the capability of agency and affiliation, acknowledging our fundamental ignorance–as we can only have partial information, and we don't know what we don't know—yet we can imagine, act, and learn.
- **Yes, And!**
    - An improvisational stance requires courage, confidence, playfulness and co-creation, reinforcing and recognizing one's agency.
- **Empathy with others**
    - Affiliation and care. Recognizing our humanity and interconnectedness, we can learn and act together, with deeper empathy guiding compassionate and relevant solutions.
- **Listen and Learn**
    - Knowledge. Paying attention helps us observe, learn together, generate relevant knowledge, and be more constructive in conversations, political actions, and design.

- **Let's Try It!**
    - Experimental attitude and confidence: Knowing we might have side effects and lack full information, we start small, learning by doing, paying attention to unexpected harms and positive synergies.
- **Serious Play**
    - Play. Nussbaum (2000) introduced the capability of "Play" as an essential ability that any society should support for its' young citizens (in her list of 10 central capabilities that any state should support). A design capability set should embody this and reinforce playfulness and an open, "beginner's mind" attitude. This can be aligned towards more meaningful ("serious") ends as the context and individual's growth allows. This could be achieved at home, in school, our community, and for larger societal challenges.

These Design capabilities help address concerns in the capability approach about the source of agency within individuals, and how to enrich and empower individuals meaningfully. Design capabilities recognizes that individuals live, think and produce in relation to others, and allows for room to grow in thinking of communal or group capabilities.

There are several other implications of embracing this design capability concept in our practice and teaching:

- Address the full capability set: It guides attention to capabilities that promote creativity, agency, affiliation and play; going beyond health, schooling, and "productive" capabilities dominant in development practice.
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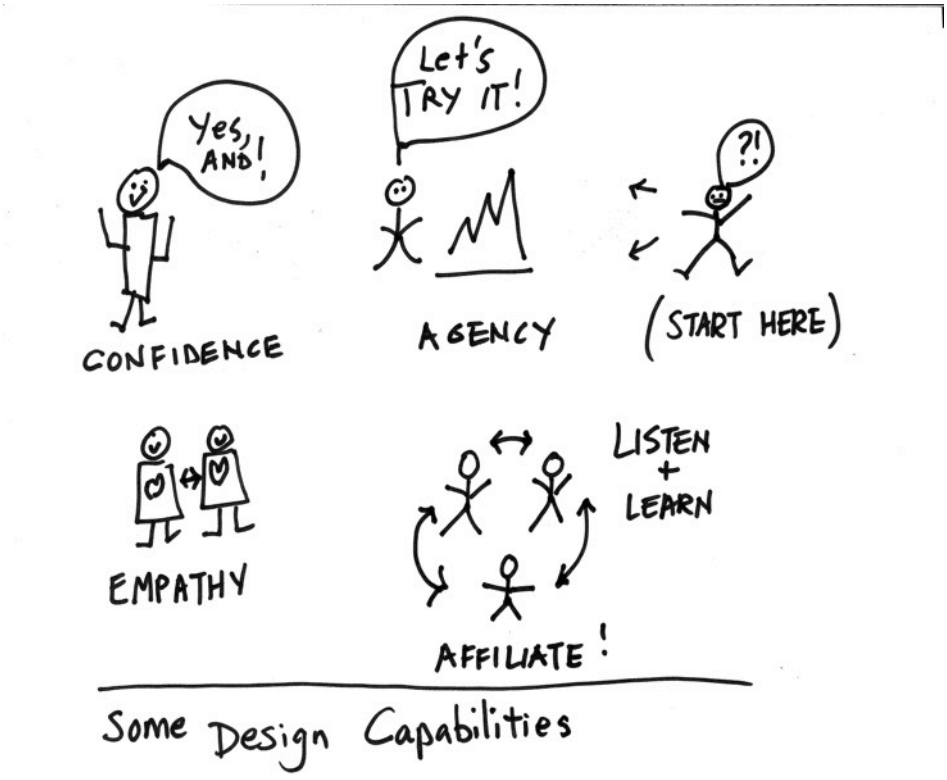


- Citizen action: this approach builds agency and empowers all of us to be more active agents promoting positive change, even with partial information.
- Defining the agenda and stating the problems: Building design capabilities will help people set the agenda and define the problems worth solving. At present, many problems are still set by others (outside experts, based on technical and demographic data and donor agendas). Design processes-- even participatory or design-thing for social impact—are often harnessed to that apparatus. Skills in facilitation, dialogue processes, liberating structures and other inclusive and empowering processes that help shape who sets the agenda and what problems we (society, community) will attend to.

- In training, helping educators go beyond teaching specific methods used by designers for innovations in institutions, to spreading the seeds for and deepening where possible the underlying freedoms of agency, confidence, creativity, and collaboration that are necessary for prototyping paradigms

Design approaches facilitate a "prototyping paradigm" to help organizations and individuals lower the barriers to understanding the context, seeing the problems within systems, exploring and generating workable, creative solutions, shortening the time span to learning. A design approach allows anyone to progress without trying to control for all possible factors and incertitude in our world. Together with our technical expertise and historical context, these can guide more meaningful action, thus further enhancing our own capabilities through meaningful work.

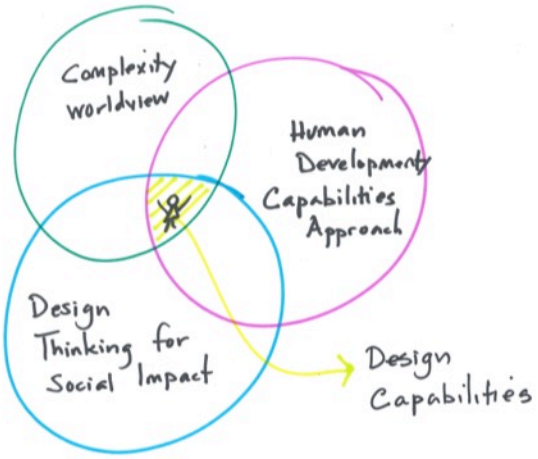
The aim is to empower all people to actively and constructively engage with the world and shape the futures we want to see while acknowledging (and not dismissing or reducing) the nature of complex problems. The role of policy-makers, leaders, educators, etc. is to help establish this "enabling environment" to support all capabilities for people at different ages and circumstances.

To generate the 21st century adaptable, systemic social innovations that we will need, we should work to expand design capabilities for all people, especially more disadvantaged often left out of planning and program designs. Each of us should do this however we can, given our specific positions in society, which will vary. In this way, extending capabilities is akin to supporting and promoting human rights.

Does it exist already? What might this look like?

Part IV. Experiments. How this way of thinking looks now and in practice

Different domains and levels. Visions for the future. What you can do already. Capabiliites + Agency + Design process + Subjective position.



Design capabilities lie at the intersection of complexity, capabilities, and design. We can enrich the mainstream human capabilities approach with designerly mindsets and

methods. To do this, we must embrace a complexity worldview (about how the world works) and take an ecosystem approach (to how change occurs). From this stance, and with design capabilities spread more widely, we can aim to solve big problems--little by little, with system-aware, potentially transformative ideas.

What does this approach look like as an approach to cultivating changemakers? What are implications for our social entrepreneurial and Changemaker education systems? We should be developing "design capabilities" and cultivating an ecosystem-based worldview in our students and in organizations we work with.

Part of my work at the Phyllis M. Taylor Center for Social Innovation and Design Thinking at Tulane University (a community-engaged university that birthed this center in 2014) is to spread design thinking education and training. Here are some examples from our current work that reflect these principles of seeding and cultivating design capabilities to a wider audience of lay designers:

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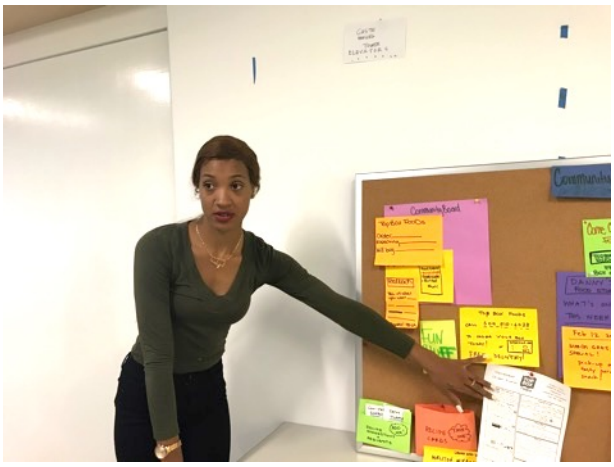
Box 1. Top-Box Foods, Liberty's Kitchen and the wicked problem of food deserts and unhealthy eating in New Orleans

In New Orleans, young people seeking work in the food industry can learn their restaurant trades at the non-profit organization Liberty's Kitchen, starting in the training program. Some then go on to Leadership Program for advanced apprenticeship, professional development and externships. A recent partnership with TopBox Foods-- a social venture selling fresh produce to low-income households—offers a select few training in design. A team of 7 young people work on this to learn and apply design practices to address the problems of poor diet and food deserts in an urban low-income neighborhood. A team of trainers (author included) has been helping these young people to "discover, dream and do" and develop ideas for residents of a New Orleans "food desert" neighborhood. Over recent weeks, working around their schedules in restaurants, these young cooks, sous-chefs and food preparers have visited residents kitchens, observed shoppers at produce markets, gathered prices and production skills, sought patterns, generated insights around their elderly, low-income user groups. Prototyping of concepts is happening now. Photos 1, 2 show teams at work.



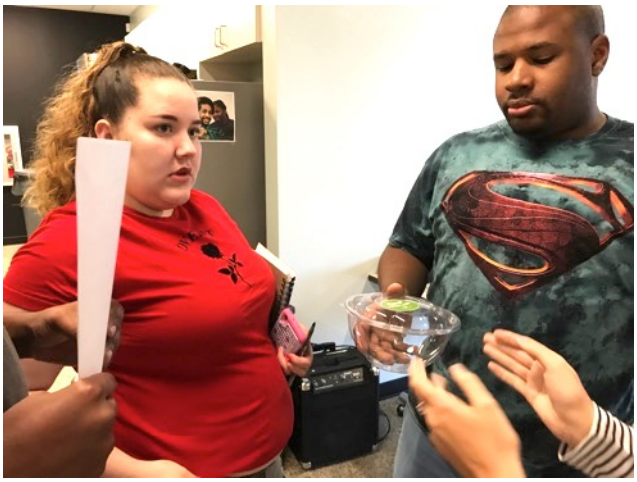


Photo 1, Left: Andryan showing a prototype of a community health bulletin board that would be posted next to elevators communicate to the residents of an 8-floor low-income apartment

complex the new fresh produce on sale and healthy prepared foods available at a corner store across the street;

Photo 2, right: Liberty and Kiall are exploring different packaging options (reusable? disposable? 7 oz? 9 oz?) for those low-cost healthy, prepared foods that they believe (based on their design research) will be part of the solution. These young people-- graduates of a food industry training program, and working in restaurants and food service already-- can make and ship them by themselves. Concepts include a low-cost grab-n-go salad and yogurt parfait. They will prepare, package and test in the corner store (and promote via the bulletin board)

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Example 2: DT & Donuts public workshops

Broadcasting seeds of design capabilities to help us address complex problems

At Tulane, The Taylor Center "cultivates and connects changemakers" able to engage with complex problems and promote positive social change. Aside from the standard academic courses and seminars, one piece is the "Design Thinking & Donuts" workshops for the public. These are free, short workshops that invite anyone to experience, hands-on, some of these design capabilities—designerly ways of seeing, doing, acting, and being. Participants are invited to join in a short, accessible, playful activity that requires no special training or preparation. They can explore it with us, and go further at their own pace. They share information, find patterns, brainstorm and suggest solutions in under 2 hours. Each workshop is organized around a problem that we convert to a design challenge, inviting creative ideas.

In early December, we invited the participants to ask: "How might we reimagine our end-of-year holiday celebrations to be more wonderful and meaningful (in these days, especially) and also to support us taking meaningful action to acknowledge the realities of global and local climate change"? (AKA, "Delightful celebrations that don't trash the climate!")

- *People start where they are and with what they know and are dealing with now.*
- *They share and synthesis of stories, seek patterns and insights, identify categories.*
- *They are encouraged to practice "Yes, And", etc. to practice those creativity muscles.*

Themes that emerged and were prototyped quickly included creating meaningful, multi-generational traditions that can be repurposed year-to-year, and communicating relevant low-impact holiday-gathering strategies via broadcast media. A key insight from one groups' synthesis was that families serving multiple dishes to meet dietary needs (even eco-friendly meals) end up **generating more food waste** *(as well as more work for the cooks). This team thus body-stormed a dinner event that leapfrogs the whole menu from conventional and traditional dishes to a totally delicious, low-impact, gluten-free vegan meal—the goal being to make it easier to prepare delicious, festive meals that work for anyone, whatever their dietary needs AND to also reduce impact and waste.*

A big challenge we all face is around this time of year are holiday celebrations and gatherings, meals, travel, and rituals (in any tradition). These are challenged by consumerism, costs, changing cultures, and family tensions. Climate change is one overwhelmingly "super" wicked problem. This was built into the challenge in modest ways that frame it more narrowly around our lives. Learning design capabilities means we can start where we are and try to aim in a better direction.

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These ideas and solutions are conceptual and provisional, yet real and actionable. They arise from these individual's own experiences, and yet are common, shared, adapted to others. These "solutions" plant a seed of appreciation for the process and capabilities within each person. Our challenge is to nurture, water, fertilize, etc. so that viable seeds can grow.

What does this look like as an approach to transformative, system-connection, system social innovation(s) in "real-world" settings?

These design capabilities are reflected to some degree in larger existing "containers" for action. These types of processes can build our "design capabilities". These embrace ecosystem thinking and a prototyping paradigm to support innovative actions in the public domain. These and other applications move beyond market/non-market debates to acknowledge the place for exchanges of different types between people in a living ecosystem.

- Formal **Social Labs,** such as those managed and promoted by Reos Partners (Hassan 2015), and documented by the McConnell Foundation (Canada), involved backbone organizations (secretariat) to manage a dialogue-rich, long-term, deliberative and collaborative co-design of solutions to conflict, reconciliation, global food systems. Social Labs work at the scale of the problems, rather than starting small with a pilot.
- In the **public sector**: design capabilities can inspire citizen action and democratic processes via building more informed, confident, action-oriented citizens, civil servants, analysts, educators, etc. (Heimbrock, USG OPM, 2017). This reflects applications of complexity theory with systemic innovation in public policy (Mulgan 2016) –connecting networks and systems, connecting systems of markets with other non-market, civil society and public sector systems.
- Civil society, citizen action and **social movements** -- like the 350.org movement to address climate change --illuminate the power of networked-based action. They reinforce the power of small things and scaling impact organically through meaningful connections, not greater size of organization or budget.
- In our **residential communities**: Co-housing, eco-villages, intentional communities, and the Transition Towns movements reflect ordinary people creating and cultivating communities for everyday life. Co-housing promotes right size communities (50-100 households) to support relationships that connecting, spending, eating, growing, making, cultivating, nurturing locally at a manageable size. Transition towns works within existing towns and small cities to support shifts to sustainable energy, production, etc. Integrating design capabilities into these might mean more training in-house in design processes and structuring communal actions around a prototyping paradigm to ease decision-making for increasingly complex problems we face.

Design capabilities supports **trans-disciplinary** research and action, which means knowledge generation beyond any specific academic discipline and intended to focus on problem solving. Trans-disciplinary knowledge-generation alliances often apply complexity thinking and touch on social innovation principles and processes. These often echo (but do not include) design capabilities. Some examples of trans-disciplinary actions and approaches:

- **Pathways approach**. The STEPS Centre UK is an academic center, policy research group, and education/training community (founded 2007) that runs research and action labs build around concepts of dynamics and participatory research to support marginalized communities finding their pathways forward to sustainable development. Their cutting edge work explores and

overlaps with complexity and social innovation, and recognizes the rise of social impact design (Ramalingam, 2015) but is not directly incorporating it. They recognize capabilities and rights, but do not explicitly teach them. So design capabilities enriches their work with research directions, topics and capacity-building approaches. (Other trans-disciplinary research and education consortia addressing complex, global problems include Future Earth (addressing the anthropocene era), TRANSIT (exploring social innovation via case studies), and the DESIS design for sustainability network.)

- **Systemic action research** in community-development (Burns 2007). This approach puts the work of "development" in the hands of ordinary people, as well as highly trained experts, recognizing the complexity in local livelihoods, resilience and other challenges. Design capabilities reinforce these approaches offering attention to creativity and agency and assessment and evaluation tools (among others).

- **Developmental evaluation.** Research and evaluation of efforts to expand "design capabilities" will need a plural epistemological framework spanning "qualitative" deep enquiry, to action research, to post-positivist scientific experimentation. Efforts to generate static "best-practices" for building these capabilities and a prototyping paradigm within this dynamic, global ecosystem would be misguided. Developmental evaluation is one set of approaches that would be helpful (Quinn Patton, 2010). It is better to think of "useful guiding principles" for continued learning and adaptation of any given action in a specific context

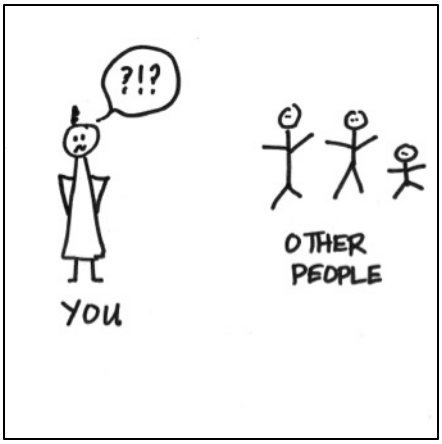
Some implications for international development theory and practice can be suggested. Embracing and digesting designerly, prototyping approaches can enhance the capabilities of the researchers to help avoid imposing false (but simple!) blueprint models, as well as the intended poor who are beneficiaries, so as to be more active participants in designing pathways forward.

Each of these activities—Social Labs, Policy Innovation, Systemic Action Research, Pathways approach, Intentional Communities--have aspects reflecting this intersection by different social actors. More explicit attention to expanding design capabilities can help each approach work better in itself, and inter-relate more effectively (connect one system with another).

We want to be more inclusive, creative, and aligned to address the more substantial and meaningful problems that people choose to engage with.

V. Wrap up and final experiments

Wicked Problems you can see and a future you wish to create. We need more design-capable changemakers everywhere. Have a purpose, be experimental, try something, and learn. Design capabilities at the intersection of complexity, capabilities, and design.



The 21st century presents new "wicked", ambiguous, difficult challenges that our world has not seen before. These are related to pressures of 7.5 billion people and more, growing levels of

consumption, dependence on extractive (vs. regenerative) industries, increasing inequality, and the huge environmental, political, humanitarian, and social challenges these bring. All of these are exacerbated and accelerated by our deepening, global, interconnectedness, which bring more unpredictability, proximity, and influence.

Recognizing that these wicked problems are with us, we are naturally overwhelmed: What are we to do?

See Figure 7: You, and Other People

I argue for expanding our "design capabilities", introducing a new concept (or at least elaborating Manzini, 2015) that integrates the practices of design "thinking" with the philosophically rich "capabilities approach" so as to promote positive, valued freedoms to "design more and be more". Acknowledging that so much or our modern, industrial models of "development" and international aid work has had unintended consequences around the world, we need to embrace complexity and think in terms of ecosystems, gardens and cultivating change agents and their social innovations.

Let us promote not just more "human-centered design" as codified and sold by professional global design teams and organizations, but as design "capabilities" for all, a set of basic, positive **freedoms** to "do more and be more" in ways that enable us to:

- Dream, make, and create in an everyday sense, as a part of living a meaningful life,
- Participate more freely and effectively in social problem-solving activities with others, in community and our larger society,
- Pursue pathways in our own lives, with ourselves as "users", and
- Be part of identifying the problems worth solving in the first place.

Starting wherever you are, with awareness of our ecosystem-- our interconnectedness, and the power of relationships, and of how the world really works--with a fuller set of design capabilities, each of us can take meaningful action at low cost, via prototyping-- to create something valuable.

I hope to bring more attention to design capabilities as they reside within this larger "capability set". Let us promote human qualities like *design literacy, creative agency, self-efficacy, self-esteem, confidence, an ability to be deeply empathetic, practical skills in using one's hands, a knowledge of materials and their qualities, wearing of different hats and points of view, learning together*, and other related capabilities.

implications. Some further implications of this approach and how we might do carry this will vary by our field and setting and context. In our social innovation and changemaker education, from kindergarten to colleges to adult learning: We should be developing our "design capabilities" early and work to cultivate an ecosystem and gardening approach so each of us can develop our creative agency and co-design our futures. A prototyping paradigm and design capabilities can guide relevant pluralistic, participatory knowledge generation. In international development (poverty alleviation, human development, etc.) the STEPS Centre, participatory research, and other alternatives exist to mainstream, top-down development practices and institutions. In thinking about traditional social entrepreneurship as a field; we must move beyond debates about market or non-market approaches, where some older social entrepreneurial debates linger. The aim is to cultivate creative changemakers who can work as intrapreneurs, noticing and creatively addressing relevant problems within large institutions and alliances.

We live in the post-developmental era, and there is no clear path forward to progress. There is only a modest path tracked by us humble and hopeful navigators. To better enjoy this exploration, we can all benefit from embracing our designer identity and a prototyping approach. In particular let us enhance design capabilities of the poorest and marginalized.

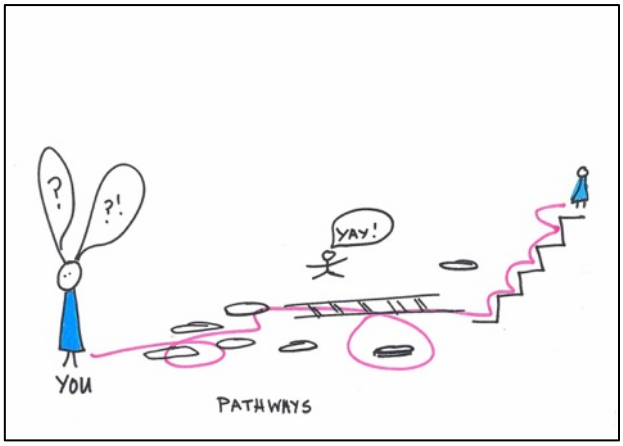
The seeds are growing and the networks expanding; we need to make more connections between these movements. This will help democratize and diffuse the design-rich capabilities we need to create, act, find patterns, envision, imagine, experiment and create our futures.

Our world with--all the wicked problems and opportunities-- needs more changemakers, whether social entrepreneurs, social intrapreneurs, or everyday change-makers (i.e., all of us).

The toolkit to generate the social innovations we need should include design capabilities, which lie at the intersection of a complexity, capabilities, and design.

Epilogue: More experiments. Do try these things at home

- Test out Ela Ben-Ur's Innovators Compass (used to structure this article and section headers)
- In holiday dinner conversations, design a simple veg. meal for 6-10 people, and ask compelling questions.
- Readers: connect with each other, identify a problem in common, and try something very small.



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