Aug 11th, 12:00 AM

Teaching Design Strategy for Social Impact: A Synergistic Pedagogical Framework

Brooke Brandewie

University of Cincinnati, United States of America

Neha Mann

University of Cincinnati, United States of America

Claudia Rebola

University of Cincinnati, United States of America

Follow this and additional works at: <https://dl.designresearchsociety.org/drs-conference-papers>

Citation

Brandewie, B., Mann, N., and Rebola, C. (2020) Teaching Design Strategy for Social Impact: A Synergistic Pedagogical Framework, in Boess, S., Cheung, M. and Cain, R. (eds.), *Synergy - DRS International Conference 2020*, 11-14 August, Held online. <https://doi.org/10.21606/drs.2020.334>

This Research Paper is brought to you for free and open access by the Conference Proceedings at DRS Digital Library. It has been accepted for inclusion in DRS Biennial Conference Series by an authorized administrator of DRS Digital Library. For more information, please contact DL@designresearchsociety.org.

Teaching Design Strategy for Social Impact: A Synergistic Pedagogical Framework

Brooke BRANDEWIE^{a*}, Neha MANN^a, Claudia REBOLA^a

^a University of Cincinnati, United States of America

* Corresponding author e-mail: brandebc@ucmail.uc.edu

doi: <https://doi.org/10.21606/drs.2020.334>

Abstract: Design and strategy are inherently oriented toward change and innovation. Innovation is about invention and implementation, but dependent on design, strategic design requires management. This paper describes an approach to design strategy as innovation for social impact. A pedagogical approach/curriculum for teaching design strategy is discussed as a core design research activity. Future-focused yet human-centered methods are emphasized as the framework for structuring the projects to yield outcomes towards some of the most pressing global issues we face today.

Keywords: design strategy; design pedagogy; interdisciplinarity; social innovation

1. Introduction

Strategy is defined as either “a careful plan of action” or “the art of devising or employing plans toward a goal” (Merriam-Webster, 2019). The purpose of strategy in an organization is to direct action toward a desired outcome. In order to develop a shared and visceral understanding of the outcome, there needs to be a visual demonstration of this strategy. Employing design and design thinking mechanisms is ideal for this purpose. (Brown, 2005). Design and strategy are inherently oriented toward change and innovation. Innovation is about invention and implementation, and while innovation is dependent on design, strategic design requires management. It is about putting together a plan to achieve an objective, and is a goal-oriented planning process that examines the relationships between people, contexts, cultures, organizations.

The purpose of this paper is to describe a curriculum for teaching design strategy as a core synergistic design research activity. This course provides an introduction to Design as a combination of strategic problem-setting and problem-solving activities within a service/ social system levels approach for a multidisciplinary audience. Students explore methods of design thinking that apply to all design disciplines to identify and analyze key problems with the aim of conceptualizing innovative design opportunities. More specifically, this paper

This work is licensed under a
Creative Commons Attribution-NonCommercial 4.0 International License.

advances an approach towards a framework for teaching design strategy through three main focus areas: *Trend as Strategy*, *Empathy as Strategy*, and *Vision as Strategy*.

First, *Trend Forecasting* is defined as a strategic research practice that detects patterns or shifts in attitudes, mindsets or lifestyle options that run against current thinking or how people normally behave, live, dress, communicate or trade (Raymond, 2010). Designers use short-term trend forecasting to inform color, material, finish, function, and purpose decisions, as well as macro-trends to connect future shifts with design strategy through forecasting approaches like scenario planning (Evans, 2004). Trend forecasting articulates these shifts to reflect what is yet to become “status quo”, yet it is also used to ensure resources (time, money, and materials) are utilized wisely. Having a steady flow of external provocation on what is possible encourages experimentation and exploration of new ideas. Ultimately, trend forecasting adds value by 1) providing clarity, 2) provoking meaningful newness, and 3) increasing self-awareness. For over 25 years, design faculty at the University of Cincinnati have emphasized and honed trend forecasting as an integrated design research methodology. For designers to learn and actively practice it in their work is a strategic advantage, thus we believe it is an essential competency that our design students should acquire. In learning this method, students become more aware of what is happening around them, and think more critically about change, and how to find patterns and identify meaningful connections. This in turn, prompts them to be more self-reflective thus aware of their own values, beliefs and behaviors, and to consider these attributes in a broader societal context. Therefore this methodology was used in the first part of the course to teach students about how to set objectives of a strategic design project.

Second, empathy places the “people” at the center of the process and is generally defined as “the action of understanding, being aware of, being sensitive to, and vicariously experiencing the feelings, thoughts, and experience of another” (Merriam-Webster, 2019). The second project focused on teaching students about how to identify opportunities for innovation within an organization. It focused on determining how to innovate contextually through user-centered mapping methods. In an era where technology is outpacing human capability in many ways, humanistic and empathic mindsets and approaches are valued in design thinking and practice more than ever. Therefore, designers need to develop crossover soft skills to conduct user research, analytical skills to interpret data, technical skills to translate it and strategy to anticipate the system in which the innovation thrives.

Lastly, design teams creating empathic design concepts must consider the non-tangible, business-oriented aspects of their work. It can be inferred that design strategists’ real contribution lies in the actual business implementation, in addition to concept realization. This part of the course focused on teaching students about identifying success measures for a design project through critical assessment methods. It referenced the *United Nations Sustainable Development Goals* as a foundation for which students would frame their final projects (United Nations, 2015).

2. Background

2.1 A Brief History

In the past, design and business have operated in silos, with design taking on the role of a service to business and marketing. However, the success of a business or brand is reliant on its design practices. In order to be able to quantify this contribution, the role of design has expanded to encompass that of the innovator, facilitator and mediator, advocating the value of design in the organization and in the broader external context – ‘as a creative, problem-solving response to change’, and as a way to enable interdisciplinary action and a shift in organizational behaviors (Best, 2011). This shift from silos to synergistic interaction of design practices and business led to a systems-approach to problem solving – Design Strategy.

The face of design strategy in organizations has changed from annual top-down planning to heavy focus on big data, shorter innovation cycles and using techniques such as competency modeling and real-options analysis (Camillus, 2008). However even this revised process of developing strategies is insufficient in adapting to the complex environment of contemporary problems. There is a need for real-time primary insights, engaging multiple stakeholders, hybridity in skills and methods like rapid prototyping for agile innovation (Brown, 2005). Design Strategy applies the principles of traditional design to complex challenges like health care, education, and climate change. It redefines how problems are approached, identifies opportunities for action, and helps deliver well-rounded and resilient solutions (Helsinki Design Lab, 2017). When translated to products, design strategy focuses on what a company should invest in doing, and why it is important. As demonstrated in Figure 1, it is an intersection of user needs, business goals and technological viability (Brown, IDEO).

Figure 1 The intersection where design thinking lives, IDEO.

Now more than ever, designers are increasingly identifying as problem-oriented as compared to traditional solution-oriented design practitioners. These two approaches can be exemplified as noun vs. verb, where a traditional designer would design ‘a chair’, a design strategist would fulfil the need ‘to sit’ (Bengtsson, 2013). In order to solve complex problems of the modern world, designers need to immerse into unfamiliar situations and collaborate with non-designers, recognize emerging patterns, draw on their skillset and the expertise of

others (Muratovski, 2016). The emerging profile of a design strategist is moving designers away from their individualistic notions of creativity, from “isolated genius” theories of innovation, towards an understanding of creativity as a social process. It is a holistic approach to innovation in organizations – of communities – rather than individuals. (Lester, Piore, & Malek, 1998).

2.2 Design Strategy, Businesses and Brands

The long-term success of organizations is heavily reliant on the consistency of their brand strategy and how it is reflected in each product while being mindful of emerging trends. Each product is a reflection of the company’s decision-making and socio-political stance. The launch of the Aeron chair in 1994 by Herman Miller was a pivotal shift in strategy not only for the producer but for manufacturers across the seating industry. The company chose to produce a chair based on ergonomic comfort instead of one based on a traditional office hierarchy. This decision is a clear statement that Herman Miller supports—literally and figuratively—the concept of lateral management and comfort over rank. A breathable mesh seat with an ergonomic frame, the Aeron came not in secretary, manager, and executive styles, but rather in small hips, medium hips, and large hips sizes. The Aeron represented flat management and the IPO boom of the 1990s.

Brand strategies represent what the brand stands for and imply a close relationship with the target audience, creating functional and emotional ties. This positioning is a result of strategic understanding of the target audience to create relatability with the user’s and brand’s values (Cagan & Vogel, 2012).

John Camillus, an educator of Strategic Management, calls problems of the complex world as ‘Wicked Problems’. He illustrates this idea with the problems faced by Walmart, in that they are unable to satisfy its multiple stakeholders with different values and priorities. The new consumer seeks social accountability towards the environment and values ethical and local production, which in their case, would warrant the adoption of new strategies, each leading to new challenges. Wicked problems like these tend to be unprecedented and do not have proven ‘right answers’ (Camillus, 2008).

2.3 Design Research in service to Strategy

In order to begin dissolving complex issues, design research with its hybrid methodologies and agile processes can benefit organizations. In the case of Walmart, they can understand their stakeholders’ values better by involving them early-on in the strategy and planning process (Camillus, 2008). If multiple stakeholders brainstorm and develop future scenarios, there will be synergistic understanding of the unique values across the organization and how it relates to the large company vision. This also benefits the organization by introducing an early buy-in opportunity by multiple stakeholders (Simonarson, 2017).

There are different levels of design strategy: strategies to decide what to execute/design (products-oriented), strategies in the system (systems-oriented) and strategies to execute

the design (organizations-oriented). To transition from a designer of 'things' to a strategist of 'systems', designers must develop core design research skills. These skills exceed incorporating research within the design process. To perform design research, designers need to have the tools to conduct 'observations' of complex human activities, then they will need to be able to 'describe' their observations, 'explain' what has been observed and described, and finally 'prescribe' possible solutions that could improve these activities (Dorst, 2008). It was important for the faculty to introduce and integrate a broad array of tools and methods of design research to equip the students with the skills described by Kees Dorst's 'Shaping a Design Revolution' as essential for designing strategies. Students would then have a broader toolkit to apply when developing a more comprehensive approach to solving complex problems of today.

Another principle of design research – Agility – is highly valuable in strategic decision-making. When dealing with complex problems, it is difficult to analyze all concepts before deploying them in action. Strategies can no longer be standardized and hence require abandoning the idea of arriving at a perfect solution before implementing it (Camillus, 2008).

The new norm requires organizations to construct and learn. Focusing on action, organizations need to build a minimum viable product, which in turn collects real-time data for them. This data will provide insights that will build up to refining and designing the strategy (Greenfield, 2014). Doing so enables them to analyze their options quickly and through specific insights from the stakeholders.

3. Methodology: Course Framework and Pedagogical Activities

Responding to the needs of advancing a methodology for design strategy for innovation, a pedagogical curriculum to teach design strategy is discussed as a core design research activity. The following paragraphs describe a course providing an introduction to Design as strategic problem-setting and problem-solving activities within a service/social system levels approach. The learning objectives of this course were:

- Understand research contexts
- Frame problems and define opportunities
- Analyse all relevant factors: social, technical, environmental, economic, political
- Model design thinking methods
- Synthesize research findings into conceptual strategies

The course was divided into three projects, all attempting to frame the *WHY / HOW / WHAT* of design strategy.

3.1 Project 1: Trend as Strategy (WHY)

The first five-week project focused on "Trends as Strategy". This part of the class aimed to teach students how to set the objectives of a strategic design project. The Trend Forecasting methodology provided an introduction for how to conduct well-rounded secondary research,

as many students came from traditional design backgrounds that emphasized more of making as compared to researching. The goals of the project were to:

- Introduce students to best practices in trend analysis and forecasting when researching, collecting, analysing and synthesizing trend inputs
- Develop students' critical thinking skills by contextualizing their research through analysis of sociological, technical, economic, environmental and political factors (STEEP factors)
- Introduce methods and techniques for interrogating the trend topics to identify potential future implications

First, students wrote down categories of their interest, mapped on the wall and synthesized to form clusters. These topics were the starting point for the students to conduct their trend analysis. Students then worked in their groups (approximately 3-4 students per group) to develop a compelling, credible bibliography of sources as a foundation for their research.

Through several rounds of analysis and synthesis, students worked within their groups to identify common patterns across their evidence, or 'manifestations' (as referred to in trend vocabulary). They ladder up from these commonalities to establish themes, which represent near-term (2-5 years) trend shifts (Figure 2). Each member of the group took ownership of refining and articulating one of the trends. Faculty provided feedback on their synthesis in a critique session, and then facilitated class discussion to map larger macro themes from their initial round of analysis.

Figure 2 'Bucketing' process of emergent manifestations during the trend analysis

At the end, each group designed a handbook encompassing the group's near-term trends (Figure 3).

Figure 3 Final trend book developed by a group of MDes students

3.2 Project 2: Empathy as Strategy (HOW)

The next five-week project focused on “Empathy as Strategy”. Students were introduced to user-centered mapping methods. Students utilized these methods to identify and propose strategies for systemic changes in a local organization of their choice.

The goals of this project were:

- Develop skills about strategic/system changes within an organization.
- Learn tools and methods for mapping systems including but not limited to offering maps, systems maps, customer journey maps, actors maps, touchpoint matrices, use cases, and blueprints.
- Develop visual and/or semi-functional prototypes

This part of the course focused on teaching students about identifying opportunities for innovation within an organisation. To propose an intervention in a brand strategy, it is key for the designer to be able to empathize with the brand's vision, mission and culture. In this course project, students individually selected one local organization of their interest. They practiced primary qualitative research methods such as semi-structured interviewing, short

ethnographies, etc. combined with secondary research through the company website, other sources in news and media, to develop a holistic understanding of the organisation culture and dynamics.

For the research conducted to be translated into visuals, the students were introduced to several data visualisation tools. They captured the timeline of the organisation as a visual narrative. This brought insight into the journey of the organisation and how each milestone re-shaped their vision and mission. Each organisation was also plotted on a brand archetype wheel, which identified its basic characteristic or perceived brand point-of-view (Fiorelli, 2015). A student working with a local community of apparel designers and entrepreneurs where they learn how to build a brand; her organisation fell in the category of *Caregiver* - as it provides a collective learning experience (Figure 4).

Figure 4 Brand archetype wheel of a local community apparel organization

Students also plotted the services provided or core competencies on a Strategy Wheel as demonstrated in Figure 5. The strategy wheel provides a picture of how a company differentiates itself from its competition (Montgomery, 2012). They determined the organizational characteristics that they want to evaluate by assessing the competencies of their selected organization and competitors. These characteristics were crucial to the success of the wheel as it represents ideal measures.

Figure 5 Strategy wheel of an academic service organization

Then they proceeded to determine a value for each of the characteristics to visualize the strategy wheel. Another essential tool for empathising with the organisation was Persona Mapping, as demonstrated in Figure 6. Personas are archetypal representations of users describing their behaviours, values and needs. A persona is based on a fictional character whose profile gathers up the features of an existing social group that represents the organization (Open Design Kit, 2019).

Figure 6 Persona of one of the designers at a local community apparel organization

Other tools mapped the journey of stakeholders, the brand, actors, offerings of the organisation and customer journey (Service Design Tools, 2019). These graphs were used to represent the system of actors with their mutual relations, providing a systemic view of the service and its context. A key mapping tool was the Empathy Map (Figure 7), frameworks that help develop deep, shared understanding and empathy for other stakeholders. The results were insights as considerations to affect the design process, e.g. improving customer experiences (Gray, 2018).

Figure 7 Empathy Map of a local community apparel organization

The findings from the research activities were combined in a displayed exhibition that captured the entire process (Figure 8 & 9). The insights from the research informed the interventions proposed by the students. Intervention opportunities ranged from revising the brand identity to a structural shift in the organisation hierarchy. Students were able to illustrate the opportunities for improvement in the organization and also created a shared vocabulary to present this holistic understanding to their peers and faculties. Selectively utilizing all of the diagrams developed in the previous phase, each student built a narrative of the organisation based on what was essential to understand the intervention.

Figure 8, 9 Student work displayed as a final exhibition

3.3 Vision as Strategy (WHAT)

The final five weeks focused on learning critical assessment methods for developing design strategies. This part of the course focused on teaching students about identifying success measures for a design project.

After having practiced design thinking and research tools in the previous two course projects, the students were re-oriented through the *UN Sustainable Development Goals* to apply these skills to social innovation design. In groups, students picked topics of interest and utilized the UN goals as the framework for strategizing a brand concept. The brands conceptualized and visualized by the students ranged from products to services, addressing global challenges across water, sanitation, hygiene, energy and sustainability. The students identified a challenge and elaborated on its impact through facts and figures for a particular population. For example, a group focused on early child teaching material for water conservation in an average American household through a behavior change strategy. Utilizing the COM-B model (Michie, Van Stralen, & West, 2011), they developed motivational characters called 'Mr. & Miss Dewy' (Figure 10) who appeared as graphic accessories on everyday household products to educate users on when to turn off the tap or how to fend off a section of the bathtub to use less water for bathing infants.

Figure 10 Motivational character illustrations of Mr. & Miss Dewy

Their proposal included the design strategy to achieve the goal along with some product examples based on the strategy (Figure 11).

Figure 11 UN Sustainable Development Goal: Water Conservation and the brand proposal

Another group focused on the same Sustainable Development Goal of Water and Sanitation, but worked on a completely different problem faced by a unique demographic in India. Focusing on a sub-goal, 'By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations', the group devised a DIY origami *Stand to Pee* device for women travelling long distances to defecate because of the lack of hygienic public facilities. Supported by articulation tools they defined their brand strategy as "Our *Stand to Pee* device helps women who want to use public toilets by upcycling hydrophobic materials, eliminating contact with contaminated surfaces and reducing the risk of UTIs."

Divergent concept-generation - Along the process, divergent ideation was promoted by utilizing different tools such as Opportunity Mind Map, Value Hypothesis, Concept-

Generating matrix, prototypes and concept scenarios, etc. all referenced from the book 101 Design Methods (Kumar & LaConte, 2012). Another student group focused on the Affordable and Clean Energy UN goal with a specific focus on the people of Caribia, a small village supported by the cacao industry in Columbia (Figure 12).

Figure 12 UN Sustainable Development Goal 7: Affordable & clean energy and the brand proposal

Their brand proposition 'Biopower' is an organization offering a system for sustainable clean cooking energy. They researched the negative health outcomes of the current methods of generating cooking energy which majorly comprised of burning wood which causes irreversible respiratory damage. They proposed wood pellets composed of biomass to be burnt instead. In order to develop a self-sustaining business model while still providing these pellets at no cost, the group identified the opportunity to design eco-stoves that could be sold. Although people from Caribia live in poverty and cannot afford their living expenses, they often spend their money on buying satellites TV. This behavior is unique to their target audience and played a major role in designing their brand strategy.

Students further plotted each concept on critical evaluation tools such as the ‘who-what-where-when-why matrix’ to sift feasible concepts that can be developed further into a strategy (Figure 13).

Figure 13 Student group evaluating their concepts on a 'who-what-where-when-how' matrix.

The figure above evaluates strategies for providing equal access to sanitation for women in rural India. The concepts generated in the previous stage varied from large infrastructural investments to individual-level products that can mediate current negative behaviors. The concepts were narrowed down based on a ranking system in the matrix that proved to create substantial impact in safety, dignity, sustainability, cultural appropriateness, positive behavior change and perceived value. This criteria for evaluation was unique to all the groups and their focus audiences.

Other tools such as Strategyzer's Value Proposition Canvas were used to analyze the concepts the students developed (Figure 14). The Value Proposition Canvas provides a set of tools and processes to systematically design and test value propositions and produce results. The visualization of value also helps establish a simple and shared language to discuss value propositions across organizational boundaries (Strategyzer, 2019).

Figure 14 Student group evaluated the value of their clean energy proposal

In addition to the Value Proposition tool, students also used a combination of critical evaluation tools to define how their products and services would create value for our customers.

The final step of the project was a pitch presentation to entrepreneurs and marketing professionals at a local Venture Lab, which activates a high density of rapidly curated startup opportunities. The students prepared a brand strategy presentation, which was followed by a short Q&A session where the students answered questions about implementation, scaling their concepts, extensibility of their strategy, etc. One of the projects was chosen to be accelerated by the Venture Lab where the presentations were held. Overall, brand strategies ranged from individual product concepts to service to systems-level interventions, and utilized the *UN Sustainable Development goals* as their framework for innovation.

4. Discussion

In this course, faculty embraced future-focused yet human-centered approaches as the project frameworks, which were: *Trend as Strategy*, *Empathy as Strategy*, and *Vision as Strategy*. Each project was facilitated for a term of five weeks by a team of two design faculty. In teaching the Trend as Strategy project, it was important for faculty to emphasize analogue 'displayed thinking', utilizing post-it notes and visuals to represent the research and mapping

techniques. Students responded well to the interactivity and flexibility of this process versus keeping their research in a digital format. Articulation of trend shifts was challenging for the students, so group work and frequent provocation from faculty was needed to aid in the framing of their content. *Trend Forecasting* is a comprehensive course taught at the undergraduate level, so condensing the learning process to 5 weeks was a challenge, given that the Trend process usually requires rigor of several rounds of research, analysis and synthesis. However, enabling students to work in groups alleviated some of the difficulty. Moving forward, it would be interesting to use the trend themes as starting points for strategic translation – that is, to identify the trend DNA, and how that would be leveraged for innovation opportunities for a brand and/or category.

Project 2, Empathy as Strategy, encouraged students to learn and practice primary and secondary design research methods. Being able to select an organization of their interest encouraged students to become more self-directed and curious within the project, while connecting with potential employers. Students appreciated the breadth of tools and frameworks to make sense of their primary research. Furthermore, faculty encouraged students to articulate their research through a variety of frameworks that made sense for their individual projects, yielding creativity and autonomy in their process and output. Finally, students responded positively to the display of their findings in the forms of soft prototypes / visualizations, which was a refreshing alternative to digital presentations.

In Project 3, students identified topics to investigate using the UN Sustainable Goals. Given the importance of involving a multitude of stakeholders early on in the strategic design process as Camillus and Simonarson suggest, students were limited in gaining primary research insight necessary to develop and refine their final concept ideas, often due lack of exposure to the designated population that they were designing for. This made it difficult for students to not only frame their strategy and justify the efficacy of their proposals at the end. To remedy this, each member of a group represented a different stakeholder and together they brainstormed a breadth of possible strategies. These were evaluated through feasibility matrices and one concept was adopted for development. This helped the groups to innovate from multiple perspectives such as product, services, manufacturing and production, branding, etc.

Encouraging students to develop a solution through a business pitch presentation helped them to keep a realistic frame about their concept/solution development. This was released as the minimum viable product towards the end of the course, leaving less time for re-iterating based on new insights. In future courses, faculty suggest that students then spend more time validating, prioritizing and developing a solution in a subsequent course. Faculty would consider limiting the final deliverable to be a visualized systems framework of strategic recommendations.

5. Conclusion

Overall this course framework was successful in providing students with an array of design research methods/tools, ranging from generative to evaluative, for which the students applied them proactively across their projects accordingly. Faculty utilized group work across the projects in order to facilitate communication and comradery amongst this cohort, since this was the first semester of their graduate experience. Most of the students experienced design through research for the first time. Students found the tools, readings and guest lecturers very helpful in the process. They also found their ideation to be catalyzed by the research methods and hence more productive in a shorter amount of time. However, many students wished that there was overlap across the three distinct projects. The shift from three separate project topics, to one topic with three congruent projects/phases, would enable the students to better grasp how these methods are utilized in relation to one another. For example, the trend analysis completed in Project /Phase 1 could be the starting point for strategic foresight and translation, to be explored then in the next two projects. The students felt that they would be more likely to emerge as experts on the subject matter in this case.

The purpose of this paper is to describe a curriculum for teaching design strategy as a core synergistic design research activity. Our collaborative pedagogical approach was complimentary of design strategy as research. It was successful in teaching students the methods and tools necessary to create strategic frameworks and recommendations towards very complex pressing global issues of today.

This course was taught in the following year, so given the analysis of the approach, some refinements made. Faculty re-imagined the sequence and interrelation of the 3 projects. The first project still focused on 'Trends As Strategy', and then to kick off Project 2, students were introduced to the UN Sustainable Development Goals earlier, for which they conducted comprehensive research on a particular goal of interest. Students were still introduced to tools/methods to develop an understanding/functional literacy of the opportunity, and then visualized a framework of that understanding that incorporated all stakeholders and associated issues. Final output was not a business pitch, but rather, students used their framework to generate a strategy to respond to the opportunity. This restructuring was much more attainable, given the complexity of the topics that they were prompted to explore. They presented strategic recommendations that were oriented towards how they might maximize positive results and limit unintended consequences, rather than identifying "solutions".

5. References

- Bengtsson, S. (2013) *IKEA the Book: Designers, Products and Other Stuff*. Stockholm: Arvinius Förlag AB for IKEA FAMILY.
- Best, K. (2011). *What can Design Bring to Strategy? Design Thinking as a Tool for Innovation and Change*. Inholland University of Applied Sciences. Retrieved from <https://tinyurl.com/y9q7na5d>

- Brown, T. (n.d.). IDEO Design Thinking. Retrieved December 3, 2019, from IDEO | Design Thinking website: <https://designthinking.ideo.com/>
- Brown, T. (2005, June 1). Strategy by Design. Fast Company. <https://www.fastcompany.com/52795/strategy-design>
- Cagan, J., & Vogel, C. (2012). *Creating Breakthrough Products, Revealing the Secrets that Drive Global Innovation*. FT Press.(2nd ed.).
- Camillus, J. C. (2008). Strategy as a Wicked Problem. *Harvard Business Review*, 86(5), 98–106. <https://tinyurl.com/y7d9k9le>
- Dorst, K. (2008a). Design research: A revolution-waiting-to-happen. *Design Studies*, 29, 4–11. <https://doi.org/10.1016/j.destud.2007.12.001>
- Dorst, K. (2008b). Shaping The Design Research Revolution. *International Conference On Engineering Design*.
- Empathy. 2019. In Merriam-Webster.com. Retrieved December 14, from <https://www.merriam-webster.com/dictionary/empathy>
- Evans, M. (2004). Trend Forecasting for Design Futures. In *Proceedings of FUTUREGROUND: Design Research Society International Conference*, Monash University, Melbourne, Australia.
- Fiorelli, G. (2015). Understand and Harness the Power of Archetypes in Marketing—Moz. Retrieved December 15, 2019, from <https://moz.com/blog/the-power-of-archetypes-in-marketing>
- Gray, D. (2018, July 21). Updated Empathy Map Canvas. Retrieved December 15, 2019, from Medium website: <https://tinyurl.com/y9lqqssp>
- Greenfield, A. (2017). Practices of the Minimum Viable Utopia. *Architectural Design*, 87(1), 16–25. <https://doi.org/10.1002/ad.2127>
- Kelley, T., & Littman, J. (2005). The Ten Faces of Innovation: Ideo's Strategies For Beating The Devil's Advocate & Driving Creativity Throughout Your Organization. Currency/Doubleday.
- Kumar, V., & LaConte, V. (2012). *101 Design Methods: A Structured Approach for Driving Innovation in Your Organization*. Retrieved from <http://ebookcentral.proquest.com/lib/uc/detail.action?docID=861699>
- Lester, R. K., Piore, M. J., & Malek, K. M. (1998). Interpretive Management: What General Managers Can Learn from Design. *Harvard Business Review*, 76(2), 86–96.
- Michie, S., van Stralen, M. M., & West, R. (2011). The behaviour change wheel: A new method for characterising and designing behaviour change interventions. *Implementation Science : IS*, 6, 42. <https://doi.org/10.1186/1748-5908-6-42>
- Montgomery, C. (2012). The Strategist: Be the Leader Your Business Needs. Retrieved December 15, 2019 from <https://tinyurl.com/yb54aqlg>
- Muratovski, G. (2016). *Research for Designers: A Guide to Methods and Practice*. SAGE. 23-31
- Penprase B.E. (2018). The Fourth Industrial Revolution and Higher Education. In: Gleason N. (Eds.), *Higher Education in the Era of the Fourth Industrial Revolution* (pp. 207-229). Singapore: Palgrave Macmillan.
- Personas | Open Design Kit. (n.d.). Retrieved December 14, 2019, from <http://opendesignkit.org/methods/personas/>
- Research and Evaluation in Education and Psychology. (2019, November 14). Retrieved November 14, 2019, from SAGE Publications Inc website: <https://tinyurl.com/ybxj7qr3>
- Raymond, M. (2010). *Trend Forecaster's Handbook*. London, UNKNOWN: Laurence King Publishing. Retrieved from <http://ebookcentral.proquest.com/lib/uc/detail.action?docID=1876097>
- Sell-your-colleagues-on-value-proposition-design.pdf. (n.d.). Retrieved from <https://tinyurl.com/y9gd534b>

Service Design Tools | Communication methods supporting design processes (n.d.). Retrieved April 20, 2020, from <https://servicedesigntools.org/>

Simonarson, M. (2017). How To Set A Company Vision And Get Buy-In From Stakeholders. Forbes. <https://tinyurl.com/ya5s3dao>

Strategy. 2019. In Merriam-Webster.com. Retrieved December 14, from <https://www.merriam-webster.com/dictionary/strategy>

What is strategic design? - Helsinki Design Lab. (n.d.). Retrieved December 3, 2019, from <http://helsinkidesignlab.org/pages/what-is-strategic-design.html>

United Nations General Assembly, Transforming our world : the 2030 Agenda for Sustainable Development, 21 October 2015, A/RES/70/1, available at: <https://www.refworld.org/docid/57b6e3e44.html> [accessed 15 December 2019].

About the Authors:

Brooke Brandewie is an Assistant Professor at the University of Cincinnati, DAAP. Her research interests focus in strategic foresight and user-centered functional apparel/product design. She is currently engaged in collaborative research on uniforms for first responders, trend/design pedagogy and entrepreneurship.

Neha Mann is a Master of Design student at the University of Cincinnati, DAAP. She has previously contributed to strategies for improving neonatal and maternal health in rural India. In her graduate work, she continues to explore design research in service to strategy.

Dr. Claudia B. Rebola is the Associate Dean for Research, and Associate Professor in Industrial Design at the University of Cincinnati, DAAP. Her work brings together design, science and technology to experiment, design and prototype innovative interactive products in the realm of health and inclusivity.