

A Call for Scaling Literacy

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Mulder, I.; Buckenmayer, M.B.; Murphy, Ryan J.A.

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**Relating Systems Thinking and Design
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A Call for Scaling Literacy

On strategic dimensions and directions of systemic scaling

Ingrid Mulder, Maria Belén Buckenmayer, and Ryan J.A. Murphy

Delft University of Technology | Strategy & Design Consultancy | Memorial University

Scaling is a motif describing the proportionate growth of innovation. Over the past decade, scholars have adapted the original idea of scaling from business to differentiate different ways to scale that are more appropriate in the context of social innovation. Scaling is sometimes thought of as a panacea: it is the end result, purpose, or answer to what we are trying to achieve. However, scaling remains ill-defined in systems change: we do not have a commonly agreed-upon language for what we are scaling, where we are scaling, or how we are scaling change in social systems. Instead, systemic designers refer to a mix of jargon from (social) innovation, design, systemic change, and/or transition design. Although these fields share similar ambitions for scaling, we argue that systemic designers need advanced scaling strategies for systemic innovation. The complexity of issues addressed by systemic design requires a better understanding of how scaling systems change happens and demands building capabilities for designing for these different dimensions and directions of scale.

The context of the study is a Master-level course building the capacity designers need to understand when maturing systemic social innovations. Students demonstrated a richness in their scaling strategies distinguishing different dimensions and layers of scale. The current work unfolds dimensions of scaling and scaling strategies necessary for systemic scaling and elaborates upon a

multi-level framework for scaling literacy. We conclude with a call for scaling literacy to further advance systemic design's methodological practices and expand the capabilities and action repertoire of future generations of systemic designers.

KEYWORDS: design capabilities, design curricula, scaling literacy, scaling strategies, social innovation, systems change, systemic impact

RSD TOPIC(S): Learning & Education, Methods & Methodology

Introduction

The concept of scaling innovation has been central to movements of entrepreneurship and start-up culture in the last few decades. The term "scaling" is conventionally a shortening of the phrase scaling up ("to increase the size, amount, or extent of something"; (Words We're Watching, 2016). In recent years, however, the word has neared buzzword status and is often invoked as an arbitrary measure assumed to mark success. In this sense, scaling becomes jargon commonly used to describe the goals—if not the ultimate goal—of a given innovation.

Whereas the logic of scaling may work at face value in business, it is not straightforward how scalability unfolds in the context of social systems change. Hence, systemic design work is particularly scalar; Barba (2019), for instance, illustrates how analysis of the recursive and hierarchical layers of systems provides valuable insight into system structure and reveals opportunities for innovation. Nonetheless, scaling is sometimes thought of as a panacea: it is the 'end result', purpose, or answer to what we are trying to achieve. Unfortunately, this end result is ill-defined: we do not have a clear definition or common language for what we are scaling, where we are scaling, or how we are scaling change in social systems. Instead of a clear reference, systemic designers currently borrow a mix of jargon from (social) innovation, design, systemic change, and/or transition design. The complexity of issues addressed by systemic design requires a more nuanced, clear, and concrete literacy to understand how scaling

systems change happens. Moreover, systemic designers must develop capabilities for designing for these different dimensions and directions of scale.

What does it mean to be literate at scaling in systems change? What other kinds of scaling exist? What should we be scaling, and how do we scale it? Finally, what does it mean to be "good" at scaling? The current work addresses these questions in pursuit of scaling literacy. We begin by providing a brief background on scaling social innovations as it relates to systemic design. We then search for a typology of scale in systems change and relate these types of scale to strategies for systems change through social innovation. Next, we present a study in which MSc students in a course on strategic design for social innovation are introduced to scaling literacy. We compare the work produced by these students with those of previous cohorts to examine the effect of scaling literacy on the strategies the students developed. Our analysis found that scaling literacy has a substantial impact on the nuance and robustness of developed strategies and studied social innovation cases. Our findings inform a framework that identifies four levels of scaling literacy.

Systemic social innovation

Societal challenges often blur boundaries between social, economic, and other dimensions, requiring nuanced approaches to developing solutions to address them. Social innovations tackle these challenges by addressing not only an innovation's viability, desirability, and usability ("Human Centered Design Toolkit", 2009) but also addressing social demands that are traditionally not addressed by the market (e.g., social cohesion, sustainable living, or an ageing society). Such innovations directed towards society as a whole become, therefore more systemic. In literature, social innovations are described as new ideas (products, services, policies, or any other innovation) that simultaneously meet social needs (or at least, do so more effectively than existing alternatives) and create new social relationships or collaborations (Murray, Caulier-Grice, & Mulgan, 2010). It is often claimed that social innovations need to be scaled to broaden their impact (Westley & Antadze, 2010). Also, Murray and colleagues (2010) describe a process of how social innovations can reach systemic change through scaling.

Systems change and scaling impact

Predictably, when social innovation becomes more and more systemic, scaling social innovation increases in complexity (Mulgan, Tucker, Ali, & Sanders, 2007). It might require coordination from unaligned or even misaligned elements of the system. Adoption of social innovation may demand stakeholders to take on radical new perspectives on the systemic problem. It may be impossible to use conventional business models to resource them. Other reasons abound — for all of these reasons, Moore, Riddell, and Vocisano (2015) build upon the work of Westley and Antadze (2010) and others to suggest three strategies for scaling social innovation: (1) scaling out (reaching greater numbers), (2) up (changing policy and law), and (3) deep (creating cultural change). Tulloch (2018) adds two additional dimensions of scaling: (4) scaling the initial conditions for change (e.g., by building social infrastructure; Strandberg, 2017) and (5) scree-scaling (legitimising and giving power to alternative solutions that address the same problem; scree are the loose stones on a mountainside that together become a landslide). These conceptions of scaling provide important alternatives to the scaling-as-growth mentality in social innovation and entrepreneurship (Dees, Anderson, & Wei-Skillern, 2004; Moore et al., 2015; Mulgan, Tucker, Simon, Ali, Rushanara, & Sanders, 2007; Westley & Antadze, 2010).

The role of scale in systemic design

Systemic design is an interdiscipline combining systems thinking and design methods in pursuit of solutions to complex problems (Jones & van Ael, 2022). The aim of systemic design is systems change: transitioning (Irwin, 2015) a system such that problematic behaviour or phenomena are no longer perpetuated by the system. It is perhaps self-evident, then, that social innovation should accrue from the work of systemic design: a systemic designer works to discover the social innovations that will drive the desired change. However, and perhaps obviously, simply thinking of new social innovations is insufficient: there is a big difference between having an idea and working to realise it. Systems change occurs as a result of social innovations created in and by systemic design processes. Put more simply, systems change occurs when social innovations are scaled (Westley & Antadze, 2010).

To reiterate: systems change occurs when social innovations — plural — are scaled. That is because innovation is fractal and continuous (Murphy, 2016): the success of one innovation often requires the success of others in parallel, and these innovations iteratively unlock the possibility of additional innovations. For this reason, current strategies (e.g., Moore et al., 2015; Tulloch, 2018) do not provide a complete picture of how to scale systems change. While any one of the strategies discussed above might be key to the success of a single social innovation, systems change often demands a combination of different approaches to scaling applied to multiple social innovations.

Although the design field has matured and the promise of design is largely welcomed, designers are still too often critiqued for remaining superficial; likewise, design contributions in the context of societal challenges and/or designing for societal transitions are sometimes regarded as marginal. Therefore, the current work seeks to establish a more nuanced understanding of scaling social innovations in systemic design, which we refer to as *scaling literacy*, and elaborates upon the needed capabilities designers need to develop more effective strategies for scaling social innovations towards systemic change.

Methodology

The current study examines how effective systems change strategies link together multiple types of scaling across different social innovations and at different stages of change. The context of the study is a Master-level course entitled Strategic Design for Social Innovation (Mulder, 2022) that prepares upcoming designers to be more “literate in scaling” when addressing societal challenges with impactful systemic change. The course refers to social innovation as a non-linear, multilevel, and networked process of change and particularly elaborates upon the maturing stages of social innovations to unravel what design activities and actions could bring forward systemic social change.

The main objective of the course is to develop designers’ understanding of how social systems scale and their fluency to pinpoint actual design activities and their impact on systemic change. The course requires students to develop design strategies for systemic change. The final assignment is a visual essay in which students propose a design strategy that helps a selected social innovation practice in scaling towards systemic

change. The course setup is a dialogical space where students discuss both social innovation and scaling while reflecting on literature and design practices (Mulder & Magni, 2022). Course materials and lectures are structured to scaffold students in reflecting upon differences regarding the role of design and the systemic dimensions and directions of scaling within social innovation practices.

The course has run for four years (n=52); the final assignment and overall instructions were similar for all editions, though the course manual and reading materials have been refined thanks to student feedback. From the third edition onwards, course alumni who further specialised in scaling social innovation were invited to share their experiences, developed methods, tools, and/or frameworks (e.g., Marradi, 2021; Buckenmayer, 2021). An exemplary strategy to scale social innovation is the RSD10 contribution, where Buckenmayer, Gonçalves, and Mulder (2021) introduce fruitful friction to better understand scaling deep in multi-stakeholder social innovation projects.

Study motivation. Whereas in the previous offerings, students generally limited themselves to choosing among existing scaling strategies (e.g., scale up, out, deep; Moore et al., 2015), the current cohort of students was deliberately challenged to think of more nuanced scaling strategies and to consider how systems change might be better achieved by "dancing" with these nuances of scale (Murphy, 2022).

Study setup. We conducted an exploratory non-equivalent group quasi-experiment (Shadish, Cook & Campbell, 2001, ch. 4). The unit of analysis is the current cohort (2021-22) of students (n=10); however, we benefit from the produced essays and learnings from previous cohorts as a benchmark.

Data collection. The final essays justifying the developed scaling strategies were regarded as the main data source. Additionally, observations from the final plenary, where students presented their scaling strategies and learnings, served as a shared reference for the authors. Figure 1 shows a collage of the produced scaling strategies.

Data analysis. We analysed students' scaling strategies in a series of online expert sessions using an online whiteboarding tool (Miro). In the first session, we reflected upon the main observations of the final presentations and aligned our coding strategy. After reading the visual essays, the scaling strategies were coded for their direction,

level of detail, and/ or dimension of scaling. We also annotated whether students distinguished what and who scaled as well as motivated where scaling activities took place. In the final session, we looked for emerging patterns and hierarchies in scaling dimensions to unravel multiple layers in scaling systems change and clustered accordingly.

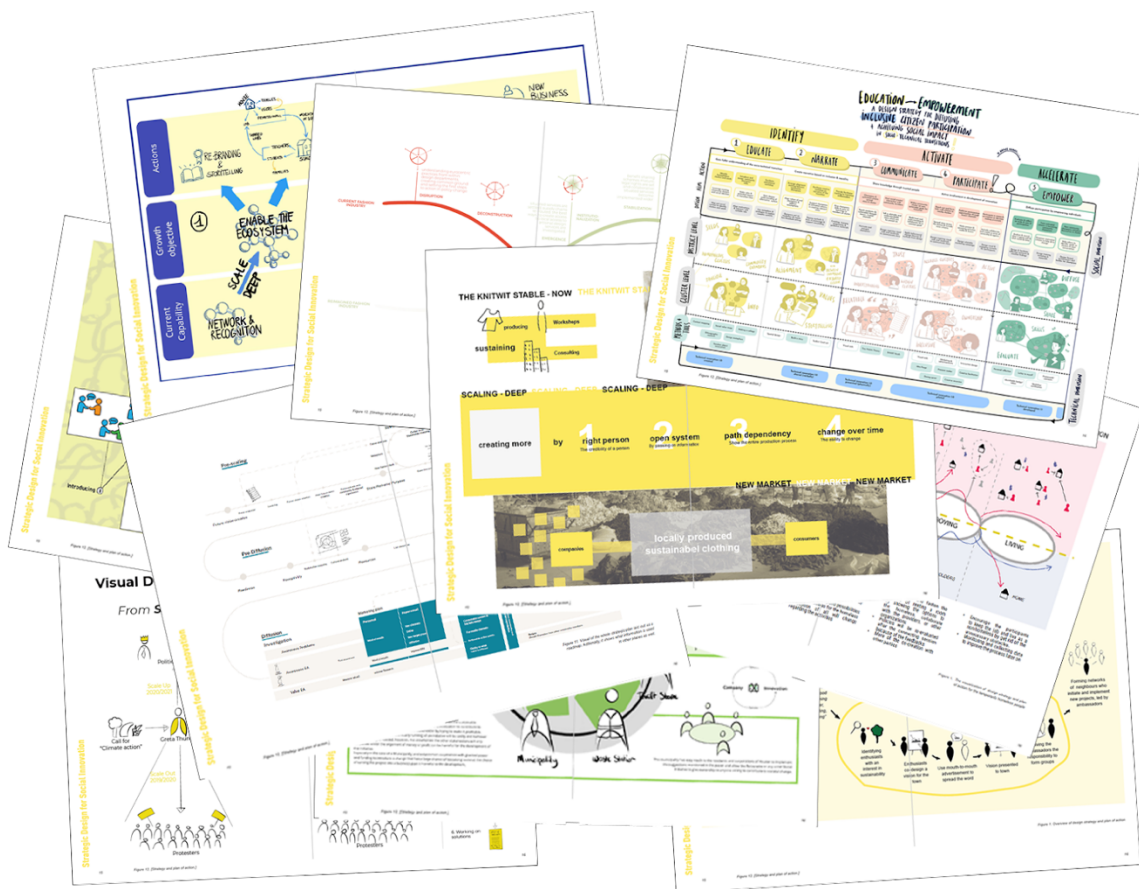


Figure 1. A collage of students' visual scaling strategies.

Findings

All students brought forward elaborate essays illustrating a richness in scaling strategies; they used different dimensions and layers of scale and articulated a variety of design activities and actions. Differently put, the delivered strategies demonstrate that the students gained literacy in scaling. We observed a deliberate use of scaling terminology amongst students when they were analysing their cases on social innovation and developing their scaling strategy. They were able to be precise on “What” to scale as well as “How” to scale. Furthermore, student strategies were clear in terms of the impact their strategy aimed for. To further elaborate, we first distinguish among multiple dimensions and layers of scale in systemic design, and next, we describe the implications of teaching scaling literacy to build strategic design capabilities.

Dimensions and layers of scale

Students presented concrete, multi-dimensional strategies and addressed multiple layers of scaling. In their respective essays, students discussed different dimensions and layers of scale. The first cluster of dimensions emphasised people, distinguishing factors such as changing awareness, understanding, values or culture, and empowerment. Frequently, students referred to the need to change awareness or understanding — for instance, by education, promotional efforts, or word of mouth. Another focus was on values or culture, often via engaging stakeholders or partners in co-creative ventures. The third kind of “people-focused” scaling involved empowerment: providing stakeholders with the opportunity to participate or even to lead components of social innovation. These dimensions related to and sometimes went beyond the concept of “scaling deep” (Moore et al., 2015).

Other dimensions of scale refer to the products or services of the innovation itself: students’ strategies extended the reach of products/services, such that more stakeholders benefited from them or that helped initiatives achieve deeper impacts. These dimensions are related to scaling out (Moore et al., 2015).

Another arena of scaling refers to the organisations driving these social innovations. These students attempted to scale the sustainability of the organisations via redesigned

business models, the organisation's skills or understanding of the system via engagement with stakeholders or partners, or via changes to the organisation's knowledge management practices. These invoked Tulloch's (2018) concepts of scaling infrastructure but seemed to address different issues of scale, too.

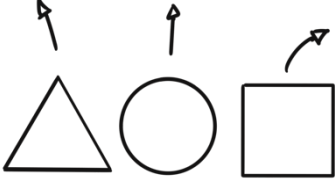
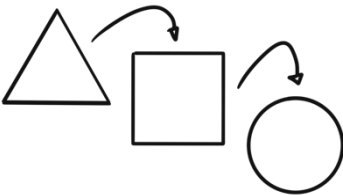
Additionally, others sought scale in the structure of the systems themselves, seeking to change infrastructure or networks such that the system produced more innovations aligned with the goal of the organisation at the heart of the strategy, again reminding us of Tulloch's (2018) scaling infrastructure and scaling scree. Finally, in one case, a strategy included a kind of scaling back: reducing the role of the organisation in leading a project such that there would be more room for the participatory engagement of citizens.

Even though the course was designed to inspire reflection on different ways scale manifests in systemic change, the effective teleological use of multiple dimensions across layers—sometimes simultaneously—was beyond expectation. The different lenses appeared to coincide with valuable ideas, suggesting that thinking across multiple scales may be a useful generative tool for strategy design.

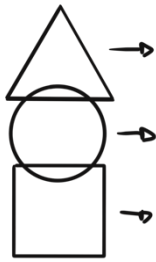
The benefits of scaling literacy

With deliberate education on scaling literacy, students in the current instance of the course produced substantially more nuanced and robust strategies for scaling social innovations. Students managed to connect multiple dimensions of scaling together in their strategies, demonstrating that they developed and applied new scaling capabilities. Below, we present four different approaches to developing holistic scaling strategies (Table 1).

Table 1. Approaches to developing holistic scaling strategies.

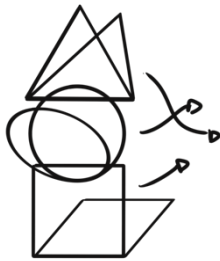
1. Optional scaling strategies	
	<p>A first approach involved designing multiple scaling strategies that would be activated depending on the context of the innovation. For instance, one project had the goal of forming networks of citizen-led sustainability projects. The student recognised that different communities would need to scale different phenomena. Some communities may already have champions, in which case the strategy would be to empower those champions to develop and actualise their ideas. Other communities may not have an already-active citizenry. In these cases, the strategy involved scaling the cultural value of these projects with events and then developing networks from the attendees.</p>
2. Sequential scaling strategies	
	<p>This approach involved scaling one dimension of the system after another. For example, one project identified that the innovation needed to first reach and engage more champions of the project before developing a deeper identity with those champions. The strategy culminated with leveraging these deeply-connected champions to empower other stakeholders to participate — and the cycle would then repeat.</p>

3. Integrated scaling strategies



This approach involves the use of multiple scaling strategies in parallel. In one project, for instance, the student's strategy involved leveraging a project's network and identity to develop an ecosystem of supportive stakeholders while also elevating the ability of those stakeholders to contribute to the project and finding ways to better maintain institutional knowledge so that lessons learned can accrete over time.

4. Multi-layered strategies



Finally, some strategies involved different approaches to scaling at different layers of the system. One project focused on reimagining the fashion industry, for instance, asserted that scaling out on a local level — multiplying the reach of grassroots, artisanal models that subvert problematic global-level issues in the industry — will lead to scaling deep at higher levels of the system, accelerating adoption of new models.

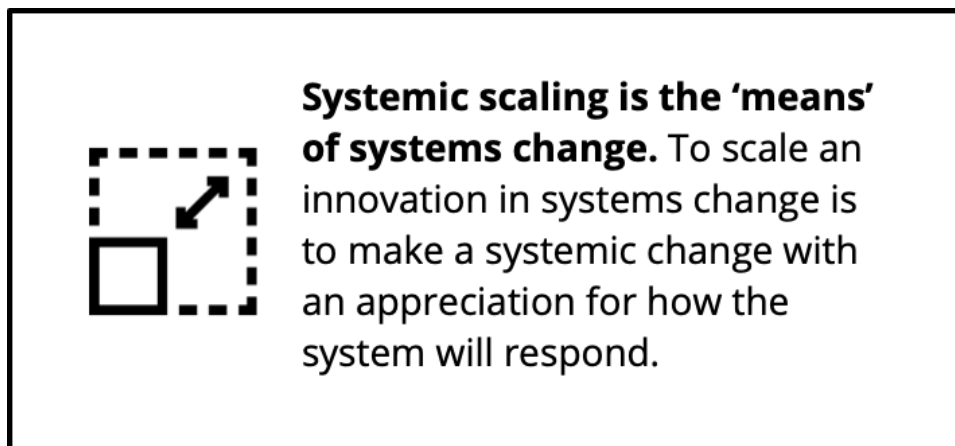


Figure 2. Key contribution to the methodological repertoire of systemic designers.

In sum, our study has several contributions to the methodological repertoire of systemic designers. Identifying the typology of strategies above not only illustrates that there are multiple ways to apply the observed dimensions and layers of scale into design actions for scaling but also shows that scaling literacy can be taught. The multidimensional conceptualisation of scaling clearly resonated with the participating students, as reflected in the resulting work. Moreover, students seem to have used their newfound scaling capabilities to design robust strategies for systemic innovation. Informed by our observations, we coin "systemic scaling" as the "means" of systems change. To scale innovation in systems change is to make a systemic change: to shift the size or extent of innovation with an appreciation for how the system will respond. Scaling literacy is understanding that scaling is a means of systems change, not the goal (Figure 2).

Discussion

This section elaborates upon the key takeaways and discusses the identified scaling dimensions and scaling capabilities as well as their implications for the systemic design (education) field. Building on that, we propose that scaling literacy is not simply all-or-none yet demands a more fine-grained lens that develops across multiple levels. We conclude with a multi-level framework of scaling literacy.

Towards scaling dimensions

Indeed, learning about more diverse scaling dimensions brings more richness to the design of systemic change strategies. Our observations informed the development of a typology of nine dimensions for scaling systems change:

- scaling **out** (Moore et al., 2015);
- scaling **up** (ibid.);
- scaling **deep** (ibid.);
- scaling **scree** - change participation and shifting attention to other aligned innovations (Tulloch, 2018);
- scaling **infrastructure** - changing the conditions that allow innovations to seed and grow (ibid.);
- scaling **across** - changing who and what has power;
- scaling **in** - changing understanding by learning and distributing new knowledge about a system;
- scaling **long** - finding ways to increase the sustainment of innovations over time; and
- scaling **back** - slowing down, stopping action, releasing resources, and reflecting.

Ergo, by encouraging students to reflect on the nuances of scaling, a richer repertoire was added to the original triplet of scaling strategies (Moore et al., 2015). It contributes toward a more diverse and nuanced approach to tackling societal challenges through scaling social innovations. The identified dimensions not only help to articulate “What” and “How” to scale but also “Where” to scale. Further, our analysis did not show any patterns in the students' strategies that suggest a prescriptive order of the scaling

dimensions. In other words, our observations reveal that scaling is an interactive and iterative process where different approaches to scaling may be used at different layers of a system and/or stages of a strategy: scaling one dimension may be necessary to prepare for scaling another. This reminded us of pace layers (Brand, 2018): clearly, different approaches to scaling may be more effective at addressing different layers of a system. It can be argued that such iterations contribute to a more complete and mature scaling strategy for social innovations, which is foundational as a pedagogical model of scaling literacy in the context of systemic design and strategy skills. A scaffold of the nuances of scaling resulted in the creation of more robust, multi-dimensional strategies by the students. Hence, scaling literacy appears to benefit both systems thinking and systemic design skills. In other words, scalar thinking may not only be an important, missing literacy for systemic practice, but teaching scaling literacy might also be an effective tool for a future generation of systemic designers.

Towards scaling capabilities

Our observations show that moving towards a broader variety of scaling dimensions benefits a designer's capabilities of understanding and applying scaling. Moreover, the metaphor of dancing with a system (Meadows, 2008, ch. 8; Murphy, 2022) allows for the flexible use of scaling dimensions while identifying leverage points to effectively change a system. Interestingly, it seems to become more evident that an important quality of a designer aiming for social innovation system change is to be flexible in thinking and acting as well as adapting to different circumstances rather than applying a specific toolkit that limits the options and possible solutions. A designer's scaling literacy becomes evident in the ability to use different scaling dimensions while being able to clearly state "What" should be scaled, "How" and "Where" to scale as well as "Who" is scaling.

In keeping with Mulder and Magni (2022), we move away from existing tool-and-methods-prescription-approaches, such as Kudoz's "Where are you scaling?" placemat, a canvas that helps designers assess the best way to scale a given social innovation (Roussin, Bird, & Roh, 2018). Without a doubt, such templates make it easier for designers to understand how to help their social innovation succeed by simplifying what may otherwise be an ambiguous task. However, if systems change is the goal,

approaches that tend to assume the only solution is already at hand may crucially miss out on broader opportunities for systems change — strategies that are not contingent on the success of a given social innovation. The nature of social innovations in systems change does not seem to allow for one specific way of scaling. Instead, scaling literacy should provide the capability to think and act in different frames, as well as allow us to break out of those frames. In our study, students who first thought about “Where” to scale found themselves capable of articulating the “What” to scale and “How” to scale such that whole-systems change may be achieved, not simply how to make the initial service offering more successful.

Towards scaling literacy

Overall, students exhibited a great variety in scaling literacy. Whereas some students limited the use of scaling to scaling (grow) a product/service, others simply drew on an existing singular scaling strategy, using it as the basis for their entire strategy. Still, others went beyond basic adaptation, finding creative ways to combine and organise different approaches to scaling in the same strategy. These different levels of literacy indicate that understanding scaling in systems change is not all-or-none; rather, there are developmental levels that may be attributable to the achievement of increasingly-advanced learning outcomes.

Different types of scaling might be more applicable in different contexts. Therefore, greater scaling literacy can enable one to identify the right approach for the scaling phase at hand. Moreover, as different scaling dimensions may be interlinked, more scaling-literate designers might be able to design systemic strategies that include multiple scaling activities for greater overall leverage (Murphy & Jones, 2021).

Table 2 shows the development of a four-level framework for scaling literacy, illustrating how designers might differ in terms of scaling literacy. Designers with higher levels of literacy are likely more capable of developing multidimensional and multi-level scaling strategies and effectively identifying leverage points to address systems change. More scaling-literate designers can understand the complexity they are operating in and can move across the dimensions of systemic scale, obtaining new frames from which to strategise—i.e., navigating different levels of scale to see the system in different ways

(Barba, 2019). At the highest level, designers who are able to take advantage of different dimensions over different levels of scaling in their strategy will give their strategy more nuance, hopefully, in turn, increasing their potential to achieve systems change.

Table 2. A multi-level framework illustrating four levels of scaling literacy.

Literacy level	Thinking style about scaling	Role of design	Exemplary scaling capabilities
0	Business thinking	Designing solutions	Identifies scaling as a necessary step in the success of the product/service
1	Social/Process Design thinking	Guiding processes and designing solutions	<ul style="list-style-type: none"> - Recognizes that scaling the design is necessary to achieve social impact - Differentiates between scaling products/services and scaling systems change
2	Systems thinking	Strategizing, guiding processes, and designing solutions	<ul style="list-style-type: none"> - Recognizes what about a system needs to be scaled to achieve systemic change - Recognizes that scaling a social innovation requires multiple kinds of scaling at multiple parts of the system: i.e., there are multiple steps between having an idea and scaling systemic change - Applies different scaling dimensions appropriately - Applies appropriate scaling tactics
3	Systemic design thinking	Connecting strategies for scale, strategizing, guiding processes, and designing solutions	Motivates how different types of scaling intersect in a hierarchy in achieving impact with a social innovation

Limitations and future directions

Although we have demonstrated that scaling literacy may be an important missing capability in systemic design, to further validate scaling capabilities future research is needed. Can we delineate the subcomponents of scaling literacy? Might we relate these constructs more directly with different aspects of systemic design skills? Similarly, the relationships between scaling literacy and the competencies of systemic design deserve further elaboration. Future research should atomise the competencies of scaling literacy and relate them directly to specific competencies in systems thinking, design thinking, and strategic design. Another direction is to explore whether tactics are useful in specific kinds of scaling strategies; e.g., Buckenmayer et al. (2021) demonstrated that fruitful friction may be used to scale deep. If there are nine dimensions of scaling, are there other tactics especially useful for addressing each? For instance, participatory and co-creative design methods might be well-suited to scaling in (learning more about a system) and scaling across (empowering stakeholders to innovate).

Conclusions

It can be concluded that designing for systems change requires a more fine-grained understanding of scale. Students in a master's level course on strategic design scaffolded to think in terms of more nuanced scaling dimensions were capable of producing elaborate, systemic strategies for achieving social systems change. As a result, the current study identified nine dimensions of scaling for systems change, four different approaches to using these dimensions in systemic scaling, and formulated a multi-level framework for scaling literacy. We call for scaling literacy to further advance systemic design's methodological practices and expand the capabilities and action repertoire of future generations of systemic designers.

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