

# The potential of design to foster academic entrepreneurship: An ethnographic study of metaLAB at Harvard

Luca Simeone<sup>1</sup>

<sup>1</sup>*Malmö University*  
*me@luca.simeone.name*

## Abstract

*Purpose-* This paper builds upon the notion of academic entrepreneurship as a way to engage with external communities to create value (Kingma 2011) and more specifically analyses how design is used to foster this idea of entrepreneurship in a lab at Harvard in Cambridge, MA.

*Approach-* The study is the result of an ethnographic investigation I conducted across 2013 and 2014.

*Findings-* In the lab analysed, design plays an important role to connect academia with external stakeholders and to sustain interactions through processes of translations, iterative prototyping, co-design. These activities contribute to develop some components of academic entrepreneurship, but also open up questions on how to evaluate this entrepreneurial dimension.

*Value-* The study contributes to the ongoing discussions on how academia can adopt entrepreneurial approaches and reflects upon open issues potentially related to some of these approaches.

**Keywords:** *academic entrepreneurship; translation; co-design; design management*

## 1 Aims

The notion of academic entrepreneurship has been interpreted by scholars in different ways. Most scholars are interested in that entrepreneurial dimension that allows academia to pursue innovation development and commercialization, for example through intellectual asset management, university spin-offs and technology transfer and brokering [1-2]. Some other scholars argue for a view of entrepreneurship not necessarily only tied to monetary outcomes, but also oriented toward creating societal value [3]. This paper builds upon a specific perspective that praises the potential of entrepreneurship as a way to connect academia with external communities [4]. Kingma argues that: “Faculty, as entrepreneurial thinkers, seek new ways to engage with the community to create value, and this value creation within a local community establishes the university as an anchor institution” [4, p. ix].

This perspective will be further discussed in the paper and will be used as a conceptual tool to investigate metaLAB<sup>1</sup> (at) Harvard, a lab institutionally affiliated with the Berkman Center for Internet and Society<sup>2</sup> and located in Cambridge, MA (USA).

---

<sup>1</sup> <http://metalab.harvard.edu/> accessed 10 October 2013.

As from the description in its official website: “metaLAB is a research and teaching unit at Harvard University aimed at exploring and expanding the frontiers of networked culture in the arts and humanities”. The projects carried out by metaLAB bridge different disciplinary domains and span from the design and implementation of digital platforms, such as *The Japan Disaster Archive*, which uses crowdsourcing mechanisms to collect, preserve, and make accessible as much of the digital record of the 2011 earthquake as possible, up to data visualization, such as in the *Library Observatory*, a set of visual tools to explore the full range of information related to the open collections of the Digital Public Library of America<sup>3</sup>.

In this paper, I reflect upon how metaLAB uses design as a core component of its activities and how these design activities foster academic entrepreneurship. The paper is based on an ethnographic study I conducted across 2013 and 2014 and illustrates how design can be used in various ways to promote academic entrepreneurship: as a way to activate translation processes, as a way to prototype ideas in contexts of use and as a way of staging encounters with external stakeholders.

Design is here seen as a meaning making activity, as in Krippendorff: “The etymology of “design” goes far back, of course, to the Latin *de + signare*, which means to mark out, set apart, give significance by assigning it to a use, a user, or an owner. [...] Based on this original meanings, one could say: design is making sense of things” [5, p. XV]. Specifically, I here adopt a very partial view on design that only takes into account its meaning-making, semiotic dimension as a means of fostering collaboration. I acknowledge the limitations of my viewpoint, as design is much more than this immaterial dimension of negotiation.

## 2 Literature review

### 2.1 The notion of academic entrepreneurship in organizational and management studies

In their classic (and controversial) book, Gibbons et al. have proposed Mode-2 as a new form of knowledge production that emerged in the late 20th Century, in which the 'context of application' is a crucial component of knowledge production processes and practices [6]. Traditional research (defined as mode-1 knowledge production) is internally initiated in academic contexts by researchers and is carried out within disciplinary borders. On the contrary, Mode-2 knowledge production is context driven, and involves multidisciplinary teams brought together to respond to real-world problems and challenges [7-8]. Although this notion of Mode-2 has been criticized by some scholars, for example for not confronting problems of gender and colonialism adequately [9], it still constitutes an interesting perspective on the needs to situate research beyond academic borders and in connection with external contexts. The triple helix [10] is another influential model that positions innovation at the intersection of reciprocal relationships across academia, government and industry.

The notion of academic entrepreneurship proposed by Kingma goes into this direction. Kingma does not deny the importance of processes such as marketability, entrepreneurial dynamics, profit-driven economics, but claims that the very process of engagement with the community is a key element for creating value. In more practical terms, although figures such as the number of spin-offs originated at a university are important, they should also be complemented by additional information, such for example how these spin-offs impact local

---

<sup>2</sup> <http://cyber.law.harvard.edu/> accessed 10 October 2013.

<sup>3</sup> For a more detailed description of the projects: <http://metalab.harvard.edu/projects/#current> accessed 25 November 2013.

communities. Economic outcomes - such as new jobs created by these spin-offs or the amount of taxes they pay - are important contributions, but in a wider perspective these data should be integrated by looking at the impact of these spin-offs also in terms of environmental sustainability, livability, social equity and so forth. Whilst this is a position shared by some other scholars [11-12], a big part of the literature in organizational studies and management still focuses on the economic potential of academic entrepreneurship [13].

This paper does not want to diminish the importance of the economic side, but specifically focuses on a notion of academic entrepreneurship that sees the need to engage with external stakeholders to collaboratively identify and create value. I use the term stakeholder in a broad sense [14], as to include all the actors that somewhat affect or are affected by academia (local communities, industry, government, NGOs, citizens). This paper claims that a balanced interplay of these actors is a crucial component in the processes of defining and creating value at a societal level.

## 2.2 The notion of academic entrepreneurship in design research

To date there has been relatively little direct discussion on how design can be used to support academic entrepreneurship.

Literature in design research has investigated the relationship between design and entrepreneurship, for example studying their different languages, approaches and practices – both as taught in design schools or MBAs [15] or in the daily processes of a company [16]–[18]. Other authors have praised the potential of a designerly approach to support entrepreneurship: Hargadon claimed that design, armed with a unique set of abilities to communicate about and deal with the ambiguities of the early stages of new ventures, should be more proactively used in entrepreneurial settings [19]; along a similar line, Walton argued for the potential of design as economic asset: “Within corporations large and small, and as corporations collectively power national and international economies, executives should count on design to make a meaningful contribution to prosperity” [20, p. 10].

At a more operational level, the Design Management Institute proposed some criteria to be used to measure the contribution of design to business:

<ol style="list-style-type: none"> <li>1. Purchase influence/innovation</li> <li>2. Enable strategy/new markets</li> <li>3. Enable product and service emotion</li> <li>4. Reputation/awareness/brand value</li> <li>5. Time to market/process improvement</li> </ol>	<ol style="list-style-type: none"> <li>6. Cost savings/ROI</li> <li>7. Customer satisfaction</li> <li>8. Developing communities of customers</li> <li>9. Good design is good for all/triple bottom line</li> </ol> <p>DMI, 2007, cited in [21]</p>
---	--

All this work is mostly oriented towards studying the potential of design to support economic ventures.

Innovation is another topic frequently explored by authors who seek to investigate the relationship between design and entrepreneurship. Cruickshank proposes a review of the academic field of innovation and puts this in connection to a design perspective [22]. Hobday et al. adopt a management and economic perspective to analyze innovation and design [23]. Design thinking is another key topic somehow related to this discussion [24–26] and it is quite often considered an effective approach to support innovative entrepreneurial ventures. Although few of these studies are explicitly oriented toward academic entrepreneurship, they still present some interesting insights. The concept of iterative prototyping is quite commonly seen as a decisive component offered by design to support entrepreneurial activities [24]. The role of design in building brand value and product identity - also through semiotic processes

of translation (e.g., from the abstract ideas behind the brand identity of a product into a clear visually designed identity) – is also quite frequently praised [17]. The potential of co-design as a way of staging encounters with a wide array of stakeholders and to collaboratively design products and services has also been quite thoroughly investigated, even though more frequently in design research [27-28] than in design management.

These three notions (iterative prototyping, translation, co-design) will be further developed in the paper and used as interpretive lenses to study how in metaLAB (at) Harvard design can contribute to academic entrepreneurship.

### **3 Approach**

The application of an ethnographic approach with the direct involvement of researchers in the field has proven to be a common method of a good number of recent organizational studies [29]. Several scholars have offered methodological insights for these kinds of analysis, often praising the importance of anthropological methods such as participant observation [30–32].

Based on this literature, I decided to use an ethnographic approach that allowed me to get in touch with the organizational life of metaLAB and to explore the role played by design within the organization. The next paragraph will illustrate how in my analysis design is a vital component to sustain different organizational processes targeted to academic entrepreneurship.

I visited metaLAB as a Fellow, in the academic year 2013-2014. I had the chance to observe its organizational life on a regular basis, participating to projects (mostly at the Berkman Center), meetings, brainstorming sessions and events.

The findings reported here draw upon data collected through direct observation, my experience as participant, unstructured conversations, email exchanges with members. I also collaborated very strictly with Sarah Newman, a fellow colleague and visual artist from San Francisco. Sarah Newman and I applied together to metaLAB and – while there - worked on a set of collaborative projects such as some co-design workshops for a joint symposium between Harvard and UNICEF.

Most of the members of metaLAB knew about my presence and were also aware of my research goals. Therefore my situated observation influenced the behaviour of the members during my visiting period and subsequently the final outcome.

The ethnographic approach I adopted generated field source data (notes, photographs, audio recording) that has been edited and organized in a single profile document. All the photographs were positioned in sequence with relative caption (data, caption, author). Audio recording was edited and saved in a database. My notes from direct observation were classified according to parameters such as data and location.

All this material has been then placed in a loose thematic narrative structure. Photographs were organized accordingly to coincide with this narrative. All this resulted in a concise textual and visual documentation of all source data. This source data was then elaborated to write the draft of the final report.

As situated anthropologist [33-34], I have studied myself while conducting the fieldwork through a kind of meta-observation that allowed me to be (somehow) aware of how my personal, emotional and cognitive involvement affected the results of the research project.

## 4 Key findings: Design for academic entrepreneurship

In the following three paragraphs, I present some findings related to how design is used in metaLAB as a way to foster academic entrepreneurship and – more specifically – to activate processes of value creation together with external stakeholders.

### 4.1 Design and translation processes

metaLAB is a research and teaching unit located at Harvard. Established in 2011, today metaLAB works with a core staff of about 10 people, but counts on an extended network of affiliates and collaborators. metaLAB is institutionally affiliated with the Berkman Center and located within the Graduate School of Design, but actively works across multiple domains. As stated in its official website, metaLAB “welcomes participation, joint project development, and information sharing” and “is a catalyst for innovation and a project incubator, crossing school boundaries, interacting with the Harvard libraries, museums, and archives, as well as with external partners (universities, cultural institutions, foundations, NGOs, corporations, public media, community groups)”<sup>4</sup>.

This strategy is exemplified by projects such as *Digital Ecologies*, a collaborative initiative started in summer 2012 with Harvard’s Arnold Arboretum. In *Digital Ecologies*, design is used to explore human-environment interactions, especially human-landscape and human-plant interactions. Through the design of concepts, prototypes and digital tools such as open databases, participatory mapping, virtual collecting, this initiative aims at fostering multiple intersections among different domains (digital cultures, history of botanical gardens, STS, interaction design). Projects developed within a *digitalSTS and Design Workshop* in June 2013 include an interactive installation for the sonification (representation of data through sound) of vital processes in trees and the *Decompository*, a curatorial space for the collection, exploration and exhibition of Arboretum decomposition in its varied forms<sup>5</sup>.

In these and other projects developed at metaLAB, diverse stakeholders coming from academia, cultural institutions, NGOs, industry, public sphere are involved at several levels, sometimes as early-stage co-creators, some other times as active users for digital crowdsourcing platforms. These stakeholders are located within their own cultural, economic, socio-material contexts, where diverse and specific languages, grammars, authorities are in place and at work. Processes of semiotic translation are needed to foster conversation and collaboration among these different languages and to make knowledge produced by specific stakeholders (e.g., academia) relevant for other stakeholders (e.g., an amateur botanist) or applicable in other contexts (e.g., the market sphere).

In metaLAB, design materials such as sketches, data visualizations and interactive prototypes are used to interact with these multiple stakeholders: through the design process, ideas and concepts undergo semiotic translations and are materialized into visual, audio, tangible formats. Design is used as a translation mechanism because it is an attempt at expressing meaning in different languages or formats or articulations (e.g., translating botanical concepts into a data visualization or interactive artifacts). I am here interested in the processual dimension of translation, the opportunity that design provides to render ideas and concepts into different representations. These representations (sketches, prototypes, data visualizations, etc.) are not less dependent from specific linguistic, cultural or socio-material conditions of semiotic coding and decoding than any other representation, such as a written text or a speech

---

<sup>4</sup> <http://metalab.harvard.edu/> accessed 22 November 2013.

<sup>5</sup> <http://stsdigitalworkshop.tumblr.com/> accessed 22 November 2013.

or a scientific paper. Design is not here considered as a universal language immediately and univocally interpreted by different stakeholders.

Design offers the opportunity to translate ideas and concepts into multiple semiotic representations, often times through quick and iterative prototyping<sup>6</sup>. This very process - the transformation across different linguistic domains – can potentially show multiple perspectives and offer the opportunity to reflect upon disciplinary and cultural differences. Familiar and well-known ideas and concepts in one language (or discipline, or cultural context) can be foreign and unknown in another. Semiotic translations operated through design can activate processes where the foreign becomes familiar and the familiar becomes foreign.

As in the Italian adage "traduttore, traditore" ("translator, traitor"), it is important to consider that translation often happens in contexts where different stakeholders have different needs and desires and where specific dynamics of power and authority are at play. Asymmetries can render the process conflictual and ambiguous. The tensions elicited in the translation processes unfold through relations of power and resistance, appropriations and remixes of meaning, cultural slippages, a continual negotiation of overlapping or competing understandings. In the *Lightbox Gallery*, metaLAB - together with the Berkman Center - elaborated some scenarios for interactive installations at the Harvard Art Museums, which are currently being renovated. As in a typical design process, metaLAB had to negotiate its way across a tensional space where different stakeholders had conflicting positions: the vision of the architect who was working on the renovation, the needs of the museum management board and curators, the economic constraints in terms of budget, and the desire of metaLAB's researchers to use this project to further their reflections on innovative curatorial technologies and practices. Design artifacts such as sketches, concepts and scenarios for the interactive installation acted as translation mechanisms and helped in putting these diverse stakeholders in dialogue.

Projects originated at metaLAB traveled across different domains: they have been presented at scientific conferences, art exhibits and to start-up accelerators, igniting very different conversations when showing the same interactive platform to an audience of art curators or to one of business angels. Exhibiting the same project to such varied audiences offers the opportunity to stage very different conversations. These conversations are a core component of academic entrepreneurship, as they connect multiple stakeholders and highlight their diverse interpretations and agendas. The tensions and frictions elicited in the process are an essential component for metaLAB to constantly get feedback on its projects and reflect upon the value created by its activities.

## 4.2 Design as a way of iteratively prototyping

The tensions and the frictions elicited in the process of translation can be partially addressed using a design strategy based on iterative prototyping.

Some of the projects carried out by metaLAB throughout the years have been developed as a series of prototypes. *Curarium* is a digital interactive platform, which "leverages the power of the crowd in order to annotate, curate, and augment works within and beyond their respective

---

<sup>6</sup> An interesting discussion emerged in January 2014 on the PhD-Design list (PhD-Design@jiscmail.ac.uk). I cannot here review the different positions presented in the discussion. I want to clarify though that I do not propose to use the metaphor of translation to represent the whole design process, but only as a lens to see some of its characteristics.

collections"<sup>7</sup>. Digital archives, also based on different data models, can be imported into Curarium, searched and browsed through a visually enhanced user interface and annotated by the users in collaborative modes.

During my stay at the lab, several prototypes of Curarium have been showed to external audiences. At an early stage, a set of wireframes illustrating the user experience design has been presented at the Berkman luncheon series<sup>8</sup>. At a later stage, an early version of the platform has been presented at the Graduate School of Design. This presentation was also aimed at finding people interested in experimenting with the platform and potentially in working on archives and catalogues not already loaded into it.

These multiple iterative design loops are strategically important for several reasons: (1) to break down complex projects into smaller components; (2) to manage big projects more easily and in an agile way; (3) to cope with lean budgets, but maintaining the possibility to scale up; (4) to release projects also when they are still at an unfinished stage; (5) and, ultimately, to gather feedback from diverse audiences.

Generally speaking, the attitude of metaLAB is to keep its projects as much open as possible. On the one hand, the feedback collected during the presentations with external audience is used to modify or fine-tune the further stages of design and development. On the other, the projects themselves are pretty open in case some of the (internal and external) stakeholders decide to take what has been developed so far, branch out and go towards different directions, for example testing a technological platform in a new context or developing new functionalities. In this way, metaLAB fosters piloting processes to test social, cultural, economic implications of ideas put in contexts, such as in the case of *Zeega*, a web publishing and interactive storytelling platform that was incubated at metaLAB and then became an independent company supported by a media accelerator in San Francisco<sup>9</sup>.

Prototypes at several stages are externally presented according to multiple formats: (a) presentations, as metaLAB members frequently give public speeches and invited talks both within and outside academia; (b) publishing, from academically oriented venues to blogs, from books - such as a series entitled METALAB PROJECTS with Harvard University Press - to experimental formats, such as “artifactual interfaces” to annotating three-dimensional objects<sup>10</sup>; (c) studio-based teaching, where students tinker with and hack interactive prototypes developed at the lab; (d) exhibits: metaLAB projects were exhibited in venues such as the Tel Aviv Museum of Art or the ZKM Center for Art and Media in Karlsruhe.

Again, in terms of academic entrepreneurship, the conversations originated by presenting prototypes in multiple formats help metaLAB in understanding how it can contribute to creating different kinds of societal value, be it in terms of knowledge production or in terms of the economic potential of a spin-off. The unfinished nature of the prototypes and the openness to modify them upon the received feedback is a practical strategy to ease the tensions and the frictions elicited in the process.

### 4.3 Design as a way of staging encounters

In some cases, metaLAB production is specifically oriented towards the creation of collaborative platforms based on mechanisms such as crowdsourcing. Projects such as the already mentioned *Zeega* and the *Digital Archive of Japan's 2011 Disasters* set up open

---

<sup>7</sup> <http://www.curarium.com/> accessed 24 November 2013.

<sup>8</sup> <http://cyber.law.harvard.edu/events/luncheon/2013/9/metalab> accessed 24 November 2013.

<sup>9</sup> <http://zeega.com/> accessed 24 November 2013.

<sup>10</sup> <http://metalab.harvard.edu/publishing/> and <http://ostracology.tumblr.com/> accessed 25 November 2013.

interactive infrastructures where users can perform their own design and curatorial activities. Both Zeega and the Digital Archive of Japan's 2011 Disasters are built on web-based platforms where users can upload, curate, remix content coming from a variety of sources and create their own interactive storytelling projects. These projects can also be collaboratively designed and developed with other users.

The collaborative dimension of Zeega and the Digital Archive of Japan's 2011 Disasters is another strategy to engage external audiences in metaLAB projects, in this case explicitly asking to be an active part of the design (or co-design) process itself. This is another way of staging encounters and to investigate the notion of value related to the production of the lab.

## 5 Discussion

The previous paragraphs showed how metaLAB uses a meaning-making dimension of design to foster academic entrepreneurship and, more specifically, to define and conduct processes that identify and create value together with external stakeholders.

The value created in these processes takes many forms: from the production of knowledge that is also of interest for external stakeholders (e.g., the crowdsourcing behind Curarium), up to the economic outcomes generated by spin-offs (e.g., Zeega). These processes can also have a temporal trajectory: the design activities conducted at metaLAB allow incubating projects at an initial stage, before they become commercial ventures. Zeega is now a spin-off supported by Matter, a San Francisco-based accelerator; concepts, ideas, processes and technology later used in the constitution of the start-up were parts of the design activities initially conducted at metaLAB by some of its founders.

metaLAB is a quite young initiative and therefore it is likely that new spin-offs or other forms of economic ventures (such as patents) will be generated over time. This entrepreneurial dimension can potentially support some of the initiatives of the lab and provide opportunities for long-term financial sustainability plans, especially at a moment when the access to government funding for research is becoming harder. As highlighted in the Harvard 2013 financial report<sup>11</sup>, with a decline in federal sponsored funding, economic revenues from national and private industry represent today 20% of the University operating budget.

In these times, entrepreneurship - in the form of intellectual asset management, university spin-offs and technology transfer and brokering - can constitute an important source of funding.

This opens up a series of important questions related to how and to what extent research should maintain some degrees of independence from the market. In a recent talk, Negroponte - the founder of MIT Media Lab and the person behind the financial viability of the lab for more than a decade - expressed the idea that one of the strengths of academic research is that it allows researchers to pursue avenues that are not immediately tied to economic revenues. His advice for researchers at Media Lab was: "If normal market forces can do it, then stop doing it"<sup>12</sup>. This is an open point, frequently debated in academic entrepreneurship literature [4], [11]: To what extent should researchers be granted some levels of independence in order to have the freedom to follow their research trajectories and/or express critical positions? To what extent is academic research accountable to external stakeholders (industry, NGOs, government, citizens)? To what extent can or should these external stakeholders be an active component in shaping the course of academic research?

---

<sup>11</sup> <http://vpf-web.harvard.edu/annualfinancial/> accessed 3 December 2013.

<sup>12</sup> <http://www.gsd.harvard.edu/#/events/mohsen-mostafavi-in-conversation-with-nicholas-negroponte.html> accessed 3 December 2013.



These questions also impact more specifically on the notion of academic entrepreneurship and how it is defined, measured and seen from many different viewpoints, such as the ones strictly focusing on the importance of monetary outcomes or the ones supporting the creation of long-term societal value, sometimes at the expense of more immediate economic benefits.

This paper suggests that design – as used in metaLAB, as a way to activate translation processes, as a way to prototype ideas in contexts of use and as a way of staging encounters with external stakeholders – can support processes where various stakeholders reflect upon the above-mentioned questions. The conversations elicited in these processes can represent a way to collaboratively think about the many different modes in which academia can create value.

## 6 Final remarks

This paper focused on a single case study. Further research is needed, also in other labs, especially at a moment when academia is facing many challenges: from rethinking its funding models, to reimagining its educational role and approach in light of the proliferation of sources such as massive open online courses. These challenges will have an impact on academic entrepreneurship.

Design – as used in metaLAB – can offer a contribution to ongoing and future discussions, by igniting and supporting conversations with external stakeholders. This is a promising avenue, but it also elicits some additional problems, such for example how to involve in these conversations the widest possible spectrum of stakeholders and how to sustain these conversational processes over time.

In order to collaboratively shape the future of academia, it is important that plural and conflictual points of view are expressed and taken into account in these moments of challenges and change.

## Acknowledgement

I would like to express my gratitude to my supervisors Maria Hellström Reimer and Per Linde, and to Joachim Halse and the anonymous reviewers for their feedback.

For my staying at Harvard, I would like to thank the entire team at metaLAB, Jeffrey Schnapp and Matthew Battles for having invited me, and Kyle Parry for his insightful comments. Urs Gasser, Rebecca Tabasky and the community of fellows at the Berkman Center were also continuous source of inspiring conversations. The daily interactions with Sarah Newman –colleague at metaLAB –have also greatly contributed in shaping this paper.

## References

- [1] S. Shane, “Encouraging university entrepreneurship? The effect of the Bayh-Dole Act on university patenting in the United States,” *J. Bus. Ventur.*, vol. 19, no. 1, pp. 127–151, 2004.
- [2] M. Wright, E. Piva, S. Mosey, and A. Lockett, “Academic entrepreneurship and business schools,” *J. Technol. Transf.*, vol. 34, no. 6, pp. 560–587, Jun. 2009.
- [3] L. Botes, “Beyond@ Ivory. Tower–From Traditional University to Engaged University,” in *Proceedings of United Nations Conference on Engaging Communities*, 2005.
- [4] B. R. Kingma, Ed., *Academic Entrepreneurship and Community Engagement: Scholarship in Action and the Syracuse Miracle*. Cheltenham, UK; Northampton, MA: Edward Elgar Publishing, 2011.
- [5] K. Krippendorff, *The Semantic Turn. A new foundation for design*. Boca Raton: Taylor and Francis, 2006.
- [6] M. Gibbons, C. Limoges, H. Nowotny, S. Schwartzman, P. Scott, and M. Trow, *The New Production of Knowledge: The Dynamics of Science and Research in Contemporary Societies*. London: Sage Publications Ltd, 1994.
- [7] H. Nowotny, P. Scott, and M. Gibbons, *Re-thinking science: knowledge and the public in an age of uncertainty*. Oxford-Malden: Wiley-Blackwell, 2001.

- [8] M. Gibbons, "Mode 2 society and the emergence of context-sensitive science," *Sci. Public Policy*, vol. 27, no. 3, pp. 159–163, 2000.
- [9] S. Harding, *Sciences from Below: Feminisms, Postcolonialisms, and Modernities*. Durham, NC: Duke University Press, 2008.
- [10] H. Etzkowitz, *The Triple Helix: University-Industry-Government Innovation in Action*. New York: Routledge, 2008.
- [11] D. A. Edwards, *The lab creativity and culture*. Cambridge, Mass.: Harvard University Press, 2010.
- [12] H. H. Thorp and B. Goldstein, *Engines of innovation the entrepreneurial university in the twenty-first century*. Chapel Hill: University of North Carolina Press, 2010.
- [13] R. Cantaragiu, "Towards A Conceptual Definition Of Academic Entrepreneurship," presented at the 5th Annual EuroMed Conference of the EuroMed Academy of Business, Glion-Montreux, Switzerland, 2012.
- [14] R. E. Freeman, *Strategic Management: A Stakeholder Approach*. Cambridge: Cambridge University Press, 2010.
- [15] J. K. O'Grady, "Design Is Entrepreneurship Is Design Is...", *Des. Manag. Rev.*, vol. 23, no. 4, pp. 82–88, 2012.
- [16] E. Hirsch, "The Paradox of Design Entrepreneurship: Are You a Risk Voyeur?," *Des. Manag. Rev.*, vol. 23, no. 3, pp. 86–87, 2012.
- [17] B. Borja de Mozota, *Design Management: Using Design to Build Brand Value and Corporate Innovation*. New York: Allworth Press, 2003.
- [18] K. Best, *Design Management: Managing Design Strategy, Process and Implementation*. Lausanne: AVA Publishing, 2006.
- [19] A. B. Hargadon, "Leading with Vision: The Design of New Ventures," vol. 16, no. 1, pp. 33–39, 2005.
- [20] T. Walton, "Design as economic strategy," *Des. Manag. Rev.*, vol. 15, no. 4, pp. 6–9, 2004.
- [21] K. Best, *The Fundamentals of Design Management*. Lausanne: Ava Publishing, 2010.
- [22] L. Cruickshank, "The innovation dimension: Designing in a broader context," *Des. Issues*, vol. 26, no. 2, pp. 17–26, 2010.
- [23] M. Hobday, A. Boddington, and A. Grantham, "An innovation perspective on design: Part 1," *Des. Issues*, vol. 27, no. 4, pp. 5–15, 2011.
- [24] T. Brown, *Change by Design*. New York: Harper Collins, 2009.
- [25] M. Hobday, A. Boddington, and A. Grantham, "An Innovation Perspective on Design: Part 2," *Des. Issues*, vol. 28, no. 1, pp. 18–29, 2012.
- [26] U. Johansson-Sköldberg, J. Woodilla, and M. Çetinkaya, "Design Thinking: Past, Present and Possible Futures," *Creat. Innov. Manag.*, vol. 22, no. 2, pp. 121–146, Jun. 2013.
- [27] T. Binder, E. Brandt, J. Halse, M. Foverskov, S. Olander, and S. Yndigejn, "Living the (co-design) Lab," *Nordes*, no. 4, 2011.
- [28] J. Halse, E. Brandt, B. Clark, and T. Binder, Eds., *Rehearsing the Future*. Copenhagen: The Danish Design School Press, 2010.
- [29] B. Czarniawska, "Organization Theory Meets Anthropology: A Story of an Encounter," *J. Bus. Anthropol.*, vol. 1, no. 1, pp. 118–140, 2012.
- [30] M. J. Hatch, *Organization Theory: Modern, Symbolic, and Postmodern Perspectives*, 2nd ed. Oxford: Oxford University Press, 2006.
- [31] M. O. Jones, *Studying organizational symbolism: what, how, why?* Thousand Oaks: SAGE, 1996.
- [32] E. H. Schein, *Organizational culture and leadership: A dynamic view*. San Francisco: Jossey-Bass, 1985.
- [33] J. Clifford and G. E. Marcus, Eds., *Writing Culture: The Poetics and Politics of Ethnography*. Berkeley, CA: University of California Press, 1986.
- [34] J. Clifford, *On the edges of anthropology*. Chicago: Prickly Paradigm Press, 2003.