Learning for a small planet
a research agenda

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Learning for a small planet is a unique research project to develop a social learning theory for the 21st century. It is ambitious, long-term, and unconventional; but it is a compelling aspiration. Many of the challenges we face today can be understood as learning challenges: economic development, the creation of a world culture that is both global and diverse, international security, the environment, health—to name a few. All these challenges require accelerated learning at multiple levels of scales at once, from individuals, to communities, to regions, to the whole world. But such deep and multi-scale learning is not simply a cognitive challenge; it entails a transformation of our very identities. Most of our current thinking about learning is not up to the task. Building on the work on communities of practice, this project will develop a theory of multi-scale learning systems. This is an urgent task because our understanding of learning guides how we perceive what is happening and decide what to do about it.

To place this theory building in context, the project aims to paint a broad portrait of learning on the planet today. How to think about learning in a globalizing world? What are trends we can observe? What do these trends suggest for practitioners in business, education, government, and the non-profit sector? Where are projects and innovations that point the way?

The research also seeks to be innovative in the way it is conducted. It aims to be a "public" research project—a kind of open-source Manhattan project on learning. Using emerging web technologies, it will involve a broad network of researchers, practitioners, and everyday learners in telling stories and exploring ideas about learning. How to involve large segments of the public in such a research project? How to bridge a wide variety of areas and perspectives? How to integrate these contributions into a compelling analysis? How to combine academic rigor with popular appeal? Eventually, the hope is to sustain a broad conversation on our individual and collective learning needs, capabilities, and aspirations: the learning of our small planet.

In my search for an academic position, I have been asked to articulate my vision for a research agenda. This document is the fruit of this thinking. Part manifesto, part project proposal, part speculation—and very much a "work in progress"—it builds on the earlier work on communities of practice to convey a general sense of the long-term research agenda I would like to pursue in the years ahead.

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Executive summary

We live in unusual times. The world is rapidly growing smaller, interdependent, and unpredictable. We are facing daunting challenges—the establishment of a global yet diverse society, a fragile environment, economic imbalances, and regional conflicts to name a few. These challenges are neither simply local nor abstractly global. They require accelerated learning at various levels of scale at once, from individuals, to communities, to organizations, to regions, to worldwide learning systems. Understanding how to enhance our learning capabilities in this multi-dimensional nexus is taking increasing urgency. This proposal outlines a broad research agenda to produce a social learning theory for our times.

A theoretical discourse is not an abstraction. It is a set of conceptual tools that enable us to see, think, and act in new ways. The learning theory to be developed in this project is intended to inform not only research, but also the work of practitioners in a variety of fields and sectors, for instance:

- *Executives* in the private and public sectors who need to figure out how to enhance the learning capability of organizations
- *Educators* who reflect on the role of education in a learning society, on the learning needs of their students, and on the relationships of their institutions to broader social learning systems
- *Government officials* who struggle to rethink their role as conveners of learning systems that include multiple government levels, private industry, and citizen groups (e.g., terrorism preparedness, health, education)
- *Policy-makers* and non-governmental *activists* who need to understand the learning implications of their positions
- *Community leaders* and *social workers* who need to consider the identities as learners that enable citizens to participate in society

To this end, the proposed agenda places theory building in the context of a broader research framework. The project consists of five components:

1. *Theory*. This project furthers the convergence of learning theory and social theory started with the work on communities of practice. Building on this earlier work, it focuses on
   - *large-scale social learning systems* involving complex constellations of communities of practice
   - *individual identity,* constructed as a learning trajectory through these complex systems

   I argue that these two elements provide the foundation for a robust social theory of learning. Each one is, I claim, a useful perspective for looking at learning in today's complex and globalizing society. But the two are inextricably linked and considering learning in one inevitably leads the other. Together, they provide a framework for theorizing learning capability.

2. *Trends*. Building on the theory, the project will hypothesize and document a number of trends in learning. This proposal describes four examples of such trends, for instance, an observation that learning seems increasingly organized as a horizontal process of mutual negotiation, as opposed to the more traditional view of a vertical relationship between a producer and a recipient of knowledge. The ultimate goal is to combine a set of broad trends like this one into an emerging and dynamic portrait of learning in the world today.
3. *Implications*. Combining the trends and the theory should produce interesting practical implications, which the project will explore. In particular, the combination can be used to frame a rethinking of social institutions from the perspective of their contribution to our overall learning capability. This proposal takes an initial look at such institutions as
    - *organizations* in the private and public sectors, where knowledge strategies entail an integration of identity-based communities with hierarchical structures
    - *civil society*, where learning calls for increasingly complex community structures
    - *governance*, where the role of convening a learning system broadens the traditional notions of government and management
    - *education*, where the theory helps reposition schooling and frame the principles of an *identity-oriented curriculum*
4. *Cases*. The empirical base of the project will be a systematic collection of stories and case studies to make the theory, the trends, and the implications concrete. Cases might include organizational initiatives, school experiments, interesting communities, large-scale learning systems, as well as biographical narratives of individual learning trajectories. Through ongoing analysis of this growing corpus of cases, the project will look for patterns to confirm or reject hypotheses. These concrete examples also help practitioners see how they can put the framework into practice.
5. *Methodology*. The fifth element of the project is an ongoing process of methodological reflection necessary to ensure that there is a systematic rigor to the development of the framework and its application.

The full proposal describes these five components in greater detail. All five components work together. The theory suggests trends and design implications. These in turn suggest cases to study, which feed back into the theory, the trends, and the implications. The methodological component adds a reflexive learning loop to the process. This reflection also focuses on walking the talk and building a learning system around the project. Not only are practitioners expected to benefit from the results of the research, they are welcome to contribute their own stories, requirements, and insights.

This project is long-term, cross-sectoral, and interdisciplinary. Its scope is meant to spawn a multitude of related projects that invite the involvement of students, from short case studies to full dissertations. In addition, the project aspires to become the kernel of a broad community of practitioners and researchers who I know are ready to become engaged in an agenda to further develop an intellectual foundation for their work.

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I am now looking for an academic home for this research, as well as sources of funding for supporting student projects, workshops, conferences, the systematic management of the corpus of cases and stories, and writing for a variety of audiences. If your institution or foundation is interested, I am ready to talk.

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Introduction

The purpose of this research project is to develop a theoretical foundation to help address the learning challenges of our globalizing world. The production of a theoretical discourse is a consequential activity to the extent that it enables new ways of seeing, thinking, talking, and therefore acting. My sense is that the concept of community of practice has turned out to be surprisingly influential precisely because it produces such a discourse: it enables people to give voice to something they already knew, but did not quite have the language to act upon. The discourse is important, but it is only a small part. It serves the enterprise of a community, which uses it for acting in the world and thus gives it its actualized meaning. It is the aspiration of the proposed research project to help build an intellectual foundation for, but also with, a community of people concerned with learning on our small planet.

The scope of the project is broad. It looks at learning as a social process that does not know national, sectoral, or disciplinary boundaries. The idea is that a learning theory for our times must be able to talk about the world itself as a global learning system in which our individual learning takes place. It cannot be confined by the traditional divisions among education, business, government, non-profit, and civic domains. Nor can it assume that learning is confined to specific settings or moments in people's lives. Learning is a property of social systems at various levels of scale. It is also the driving force of lifelong trajectories that we build in the context of these social systems.

The horizon of the project is long-term. I plan to work on it for the rest of my career. It is also long-term in its outlook: it considers the evolution of learning in society over a time frame of a few decades. It does not take current systems as given, and short-term improvements to these systems are not the driver of the work. The project seeks to create a vision of learning, of what is required, of what is possible. Such a long-term view does not exclude immediate relevance. I believe we need to act. But the project places imperatives for action in the context of a long-range view of what a learning society needs. It uses this long-range view to inform opportunities for action or to reinterpret current developments and projects as to their long-term significance.

Developing a discourse on learning for a shrinking planet is thus both unreasonably ambitious and reasonably humble. It has to be ambitious in its scope and horizon to do justice to its topic. But it has to be humble in claiming only to provide the underlying discourse—the thinking tools, not finished solutions or plans of action. A discourse, no matter how interesting, is lame without a living community.

At a time when the world seems as small as our challenges seem complex, our understanding of learning needs to match the tasks at hand—whether we consider the environment, poverty, health, crime, terrorism, education, the politics of globalization … or our very own place in all this. We need models to learn how to learn at multiple levels of scale, from the personal to the planetary. Increasing our capacity to learn—individually and collectively—is taking on a special urgency if we see ourselves caught, as I believe we are, in a race between learning and self-destruction.

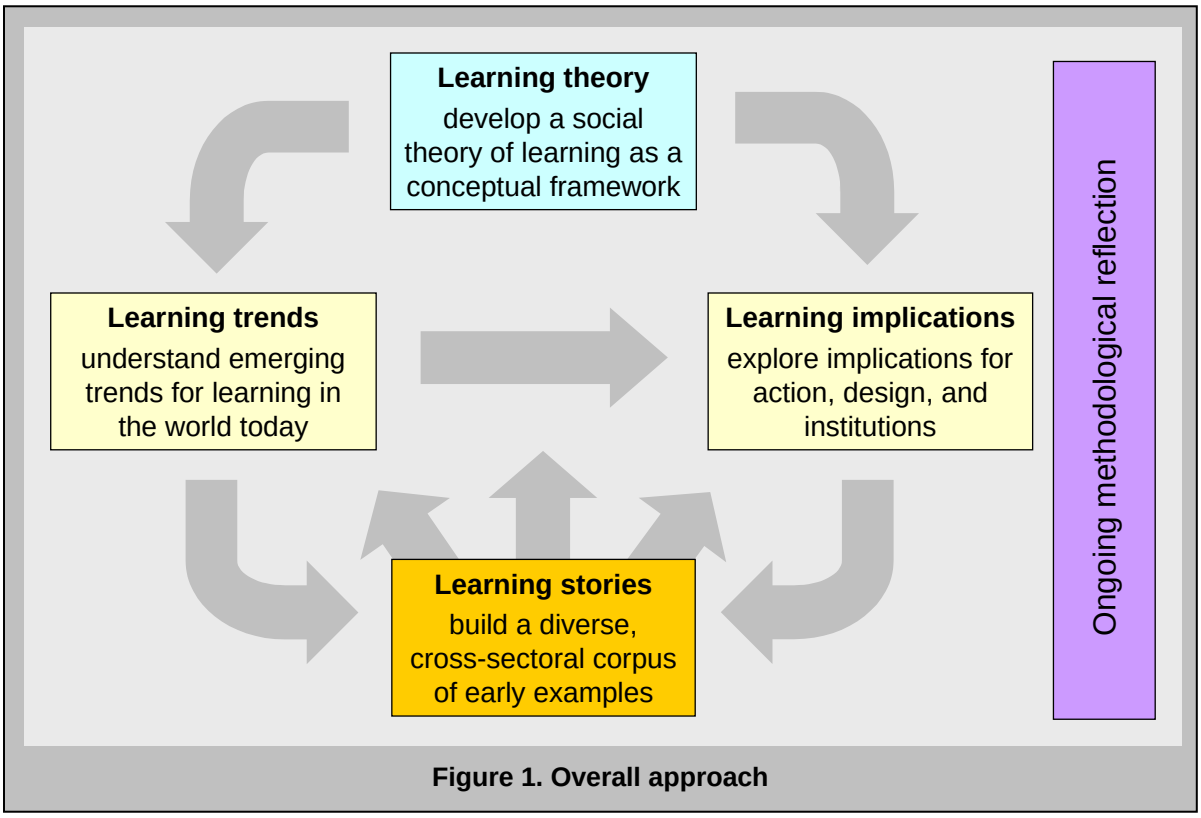

Figure 1. Overall approach

Overall approach: five components

To help make sense of and address the learning challenges we face today, the current project will further the convergence of learning theory and social theory started with the work on communities of practice. A disciplined social theory of learning has to meet a number of criteria. It must:

- honor what is fundamental about human beings and their societies
- elucidate what is specifically contemporary and point to what is emergent
- enable new possibilities for action and research
- be accountable to the world in two ways:
  - provide an account of data acceptable to its own disciplinary communities
  - be useful more broadly to the very learners the theory speaks about

In light of these requirements, the project as I currently see it needs to include the five components shown in Figure 1:

- *Social learning theory. What extensions to the current theory are useful?*
  Develop a theoretical discourse on learning that focuses on both identity and large-scale social learning systems. Doing so by building on the work on communities of practice will expand the theory while preserving the focus on the negotiation of meaning that is a hallmark of its perspective on learning.
- *Learning trends. Where is learning going in the world today?*
  Look at broad trends and patterns in learning that can be better understood in light of the theory. These trends place new requirements on the theory and paint a picture of the world in which to position efforts to promote learning.

- *Learning implications. What does this suggest for supporting learning?*
  From this combination of theory and trends, develop design patterns for action and explore the role of social institutions such as schooling, business, and government.
- *Learning stories. Where can we see advance signs of these directions?*
  Develop a corpus of case studies, stories, biographies, articles and other data that represent emergent illustrations of the theory, the trends, and the implications. Analyze this diverse corpus of examples of learning systems to uncover patterns and principles.
- *A research methodology. How to make the research rigorous, consistent and useful?*
  Reflect on the development of a framework combining theory, trends, and practical implications, and the use of stories to validate this framework. Reflecting on the research enterprise and its methodology is important for two reasons. First, its orientation to the future through theoretically-driven trends and implications poses some methodological challenges about the choice and treatment of data. Second, it is itself a learning journey; and one of its challenges is therefore to try to be consistent with its own principles.

All five elements are facets of the same research enterprise. They have to be developed in parallel and in interrelation. The theory illuminates trends and suggests design implications. These in turn suggest examples that are interesting to investigate. The resulting corpus of examples anchors the whole project in observable cases, which in turn suggest additional trends, implications, and conceptual refinements.

A boundary-crossing research enterprise

This project will need to combine theory and practice in ways that are not restricted by sectoral or disciplinary boundaries. The concept of community of practice and the attendant theory of learning has influenced thinking in many academic fields as well as numerous areas of application in organizational design, education, government, and information technology. Whichever school or department I end up being primarily attached to, this new project will inevitably blur disciplinary boundaries. It will also need to be systematically cross-sectoral for two complementary reasons:

- *Sectors share similar learning issues.*
  Business, government, non-profit, educational, and civic organizations share many of the same learning challenges. They have a lot to learn from each other. Finding patterns and principles that cross sectors is therefore a fruitful endeavor, which is likely to yield new insights and innovative ideas.
- *Problems requiring learning cut across sectors.*
  Most significant learning challenges today cannot be addressed within the confine of a given sector. Take the example of the environment: our ability to learn in this area depends on coordinated actions from business, government, research, philanthropy, education, etc. Similarly, the learning trajectory of a person integrates learning in private life, at work, in civic engagement, in politics, in instructional contexts, etc.

The rest of this paper uses illustrations from business, education, and civic sectors. It describes each of the five components of the research agenda in Figure 1 to clarify what they contribute to the project and foreshadow the directions in which I intend to take them.

1. Social learning theory: the production of meaningfulness

To a large extent, learning theory has focused on the mechanics of learning—brain research, genetics, evolutionary psychology, cognitive science, information-processing models. The theory I am proposing to develop focuses on meaningfulness. It is not a replacement for theories of the mechanics of learning. It addresses a different level, just as the interpretation of a painting in terms of its meaning addresses a different level than a study of its canvass, techniques, brush stokes, and pigments, even though these factors of course play an important role in the interpretation of the painting. The study of the mechanics of learning is very relevant and useful, both theoretically and practically. But I will argue that focusing on meaningfulness is also critical because it is the level at which learning becomes part of the experience of being human. Without a focus on meaningfulness, we are likely to miss what is most important about human learning—whether we are building theories or trying to foster learning in practice.

The community of practice theory was beginning to focus on meaningfulness by placing learning within a social context in which the meaning of learning could be negotiated. It is a social theory of learning in that it develops from the premise that we are fundamentally social beings and that this obvious observation, far from trivial, is key to understanding learning when the focus is on meaningfulness:

- The negotiation of new meanings—not just the acquisition of new skills or information—is fundamental to human learning.
- It is in the social nature of our being that we root our ability to negotiate meaning.
- The negotiation of meaning is embedded in the practice of specific human communities. These communities and their practices provide material for our learning—language, artifacts, interpretation of the world, whether we are interacting with others or by ourselves.[1]
- So understood, learning transforms our engagement the world as well as our being in the world. Learning is a therefore a social becoming, the ongoing negotiation of an identity that we develop in the context of participation (and non-participation) in communities and their practices.

The project proposed here builds on this foundation. But it attempts to develop a learning theory for a globalizing world, for a small planet. To this end, it pushes the theory in two opposite directions at once:

- In one direction, it focuses on *large-scale learning systems* that include a whole constellation of interrelated communities, in interaction with other structuring elements (institutions, markets, culture, governance, etc.).
- In the other direction, it focuses on the formation of *identity* as a trajectory through multiple communities, with a focus on the processes by which the person is constructed across contexts.

[1] It is important here to distinguish a social theory of learning from a theory of social learning. A social theory of learning claims that human learning is fundamentally social in the sense defined here, whether it takes place in social interactions, in a group, or by oneself. This theory therefore does not suggest that we learn better in groups or in other interactional contexts or that individual learning is somehow inferior or to be avoided. I want to offer this clarification because such superficial interpretations have turned out to be quite common. Nor does a social theory of learning deny our genetic heritage; it simply claims that our experience of our genetic given is under culturally based interpretation.

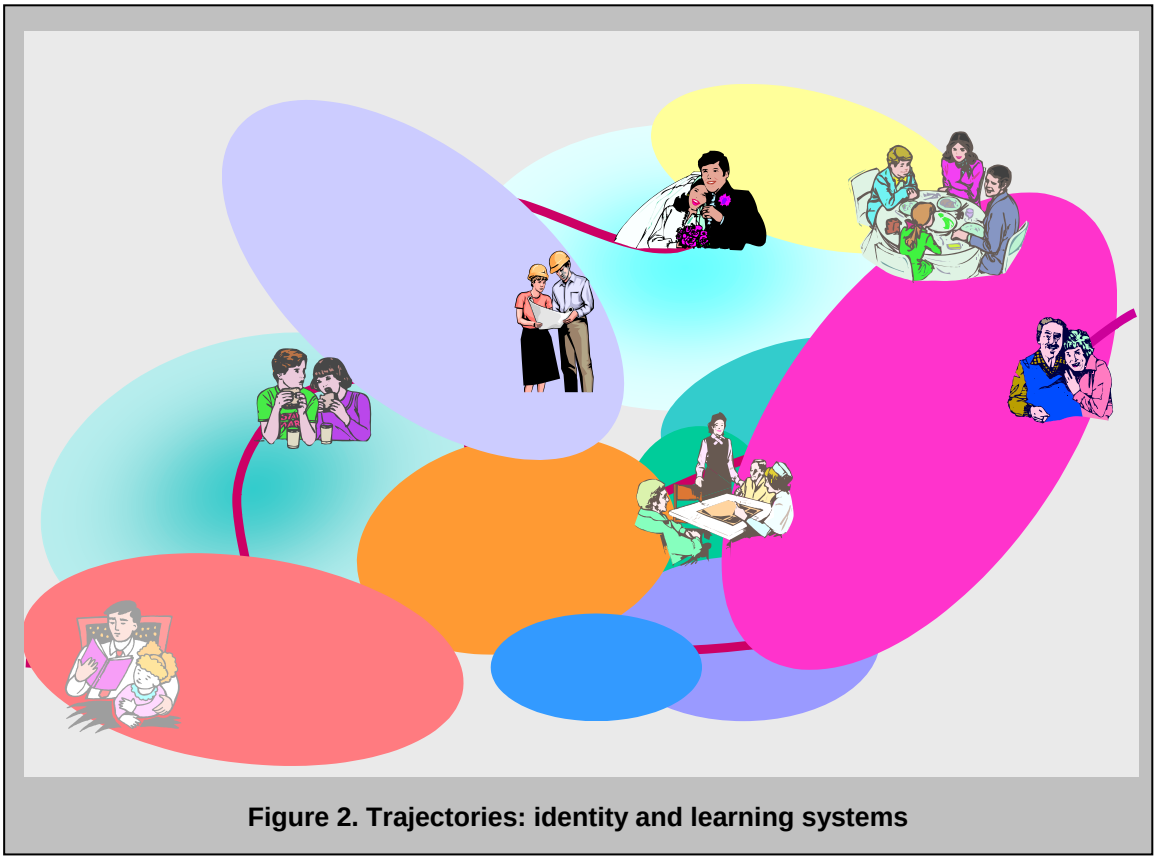

Figure 2. Trajectories: identity and learning systems

This simultaneous emphasis on large learning systems and on individual identity is illustrated in Figure 2. Today, the contexts for negotiating meaning and identity are broadening and complexifying.[2] We are exposed in various ways to a great variety of practices and communities. In such a world, the role of individual identity is increased as the locus of the negotiation of meaning. This is consistent with the focus on communities of practice. Indeed, the "community of practice" theory predicts that as societies become more complex in terms of forms of participation, the negotiation of identity becomes a more individual enterprise. In a simple situation where there is one community, the development of individual identities and the development of the community are more or less parallel. There is companionship is negotiating an identity. In complex situations where everyone belongs to very large numbers of different communities over the course of their lives and at any given time, the parallelism disappears because each person is a unique intersection of multimembership.[3] The project of identity is at once more fragmented and more individual. Theorizing learning in these terms requires a dual focus on identity and complex social learning systems; this is the core theme of the project.

The rest of this section revisits some of the foundational ideas of a social theory of learning to give the reader sense of the conceptual framework I would like to develop.

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[2] Saying that the community structure of the world is complexifying is not an argument that modern life is inherently more complex than human life was earlier in any general linear sense; it is merely saying that we are made aware of a wider range of possible forms of participation—some of which we engage in and some of which remain foreign.

[3] From a theoretical standpoint, this reasoning does not take the individual as the foundation of agency, but regains a notion of individual agent from the theory itself. In other words, the individual as we conceive of it today is not the point of departure of a theory of identity, but the product of the increasing complexity of the community structure of society (See Wenger, 1998, ch. 6 for more details).

Agency and structure in social learning systems

On way to interpret the early work on communities of practice is as an initial attempt to bring together social theory and learning theory. In this regard, the theoretical thrust of the current research project is to further this mutual elaboration. One of the central questions in social theory is the relation between social structure and agency. Some theories give primacy to one or the other. Some assert that social structure—societies, cultures, history—are primary and individual actions are merely a reflection of membership in these structures. Others assert that social structures are but the emergent property of an aggregate of individual actions. More recent developments in social theory have emphasized the ongoing, mutual constitution of the two.[4]

From this perspective, communities of practice are a context in which structure and agency meet through learning. The community and its practice represent a social structure; membership and engagement in practice represent agency. The community of practice is a linchpin concept for both learning and social theory because it refers to an intermediary level of analysis in which learning brings structure and agency in close interaction: the community is "within reach" of the members, so to speak.

This is in contrast to other levels of analysis that are largely beyond the reach of individual participants: on the one hand, broad issues of history, culture, and social structures writ large (on which social actors have little direct effects), and on the other hand, underlying issues of individual psychology and biology (also largely beyond the reach of everyday awareness). In this regard, the focus on communities, practice, meaning, and identity represents a specific slice on the question of human learning. This mid-level focus is represented by the peach-color band in Figure 3.

The current project maintains the theme of the structure/agency interplay but expands the scope as shown in Figure 3. In each case, the focus is on multiple communities, as illustrated earlier in Figure 2, but in ways that mirror each other. Large-scale learning systems include many communities of practice, and our identities reflect the fluidity of our membership in multiple communities, at the same time and over the course of our lives. This simultaneous focus on constellations of communities of practice and individual trajectories will place emphasis on aspects of the theory that have not received as much attention as communities of practice *per se*: boundary structures, multimembership, cross-community trajectories, various modes of belonging, and large-scale properties of composite systems.

Broadening the theoretical scope is not to abandon the focus on communities of practice. Because of its mid-level character, the concept of community of practice is a useful entry point into the study of learning systems and identity formation. It is a way to account for both the learning complexity of large social systems and the partiality of our participation in them. Indeed, our participation in specific communities acts as a mediating context of engagement for negotiating the meaning of large structures and our experience of identity in them. We may work for a large organization, but interact with a

[4] A good example is "structuration theory," as developed by Anthony Giddens (1984), which asserts that social structures and social agency always constitute each other through human actions, though as much through unintended consequences of action as through intended effects. Many of the concepts developed here are instances of structuration processes, starting with learning in communities of practice.

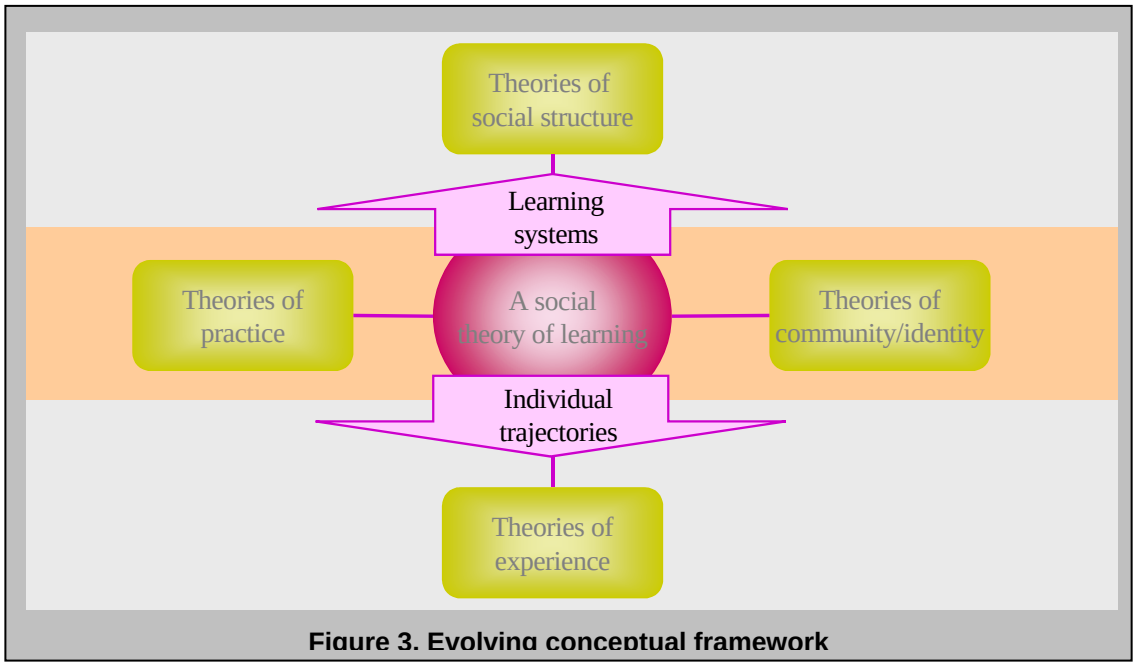

Figure 3. Evolving conceptual framework

much smaller community of colleagues with whom we discuss what it means to belong to the larger organization.[5]

The next sections build on the duality of learning systems and identity. First, I describe the structure of large-scale social learning in terms of five dimensions relevant to the structuring of learning. Then I define identity using mirror images of the same five dimensions. [6] Finally, I make a case for taking the duality of identity and learning systems as the foundation for a learning theory. I argue that when it comes to the production of meaningfulness, learning is subsumed under identity and that social learning systems provide the context for this process.

Large-scale social learning systems

Considering the community structure of large-scale learning systems brings to bear a number of dimensions that have been traditional concerns in social theory:

- *Scale*: the "fractal" nature of learning systems with communities forming nested levels of aggregation
- *Space*: the multiplicity of heterogeneous practices that constitute a learning system and the boundaries between corresponding communities
- *Time*: rhythms and generations as communities evolve through interactions among their members and with other communities
- *Culture*: the systems of signification by which we negotiate meaning and create local interpretations in various practices
- *Power*: the issues of legitimacy by which learning becomes knowledge, internally in communities, and in broader social systems

[5] Using the biological metaphor of the study of life, one could compare the level of a community of practice to that of a "cell." It is not the smallest possible unit, but it is the smallest one that has all the characteristics of life. Similarly, the community of practice is the most basic social structure that has all the characteristics of the structure/agency interaction through a history of learning.

[6] See Wenger (1998), especially Part II, and Wenger (2000) for more detailed, but earlier, formulations of these ideas.

It is worth reviewing these dimensions briefly to provide a clearer sense of the theory. The reader in a hurry can skip to page 10.

Scale: the fractalness of community structure

Communities are defined at multiple levels of scale, from local groups to large umbrella communities. You can be a member of a local community of practice of Java programmers at your company, all the way to the worldwide Java community, with all kinds of levels in between. When talking about social learning systems, the issue of scale is not to move from the small to the big, but to explore how the small and the big coexist and constitute each other. Communities are nested within another in a "fractal" structure. By fractal, I mean that each level of aggregation is constituted by similar structures at a lower level, but that new levels of aggregation have emergent properties not found at lower levels. Some properties are gained, such as the ability to "sanction knowledge," which often exists at the level of a discipline rather than local communities. Some properties are lost, such as regular face-to-face interaction. But the community structure exists at all levels—with *identity* being the scale-free property that remains intrinsic across levels. In this context, I would define *community formally as the "fractal projection of identity*."

Space: diversity and boundaries

At each level of scale, the social space of a learning system is defined by the multiplicity of practices and communities that interact to constitute such a system. Along this dimension, it is important to focus on the boundary structure of the system, the specific kind of learning that can take place there, and the processes by which it takes place. Indeed, these boundaries are both areas of possible troubles—ignorance, misunderstanding, mistrust—and areas of high learning potential—novel combinations, radical innovation, creative solutions.

Note that this space dimension is related, but distinct from, and orthogonal to the scale dimension. Focusing on the community structure of large-scale learning systems along these two dimensions provides a way to study their internal structure as well as their connections with other learning systems. Along the space dimension, it makes it possible to understand the system in terms of specific domains of knowledge. For instance, the community of neurosurgeons in a hospital needs to interact with the community of anesthesiologists, nurses or hospital administrators locally and develop the necessary boundary processes to enable mutual learning. At the same time, along the scale dimension, the communities of practice to which people belong locally are connected to other similar communities of practice elsewhere. The local neurosurgeons' community is also connected to a broader community of neurosurgeons, with colleagues in other hospitals, universities, cities, and countries. The local community will need to develop these connections to learn from these other locations.

Time: learning histories

The histories of learning systems develop in the interaction among these levels: communities form new generations, adopt new technologies, make new discoveries. Communities of practice have their own lifecycles and generational waves. In addition, they themselves arise and disappear, giving broader systems their rhythm of flux and crystallization, innovation and rigidities, stability and transformation. Learning systems are always dynamic even when they appear stable. They persist over time by

reproducing themselves across generations and changing circumstances. Time is therefore never simple continuity. And change always involves a historical legacy. Death and birth, development and aging—of people, of communities, of ideas, of technologies—are a fundamental part of this process. Of course, in the case of a social learning system, how much pain death and birth create for participants may or may not be socially and personally acceptable. Renewal and transformations involve human identities that are invested in the histories of specific communities.

Culture: participation, reification, and negotiation

Social systems provide resources for the negotiation of meaning in two ways. On the one hand there is the structure of participation in the practice of various communities. On the other hand, there is the structure of reification, that is, the process of producing objects (physical or conceptual artifacts) through which communities give their practice an embodiment in the world. At each moment of engagement in the world, we bring these two structures together to negotiate the meaning of our experience.

This dual character of human practice as a context for meaningfulness was brought to life for me one evening as I was having dinner with a friend. He served me a glass of wine and asked me what I thought of it. I said that it was good, but I must have offended him because I did not know that he was a wine taster in his spare time. He started to describe what this glass of wine was for him, and there were hazelnuts, strawberries, oak, and colors in different place in the mouth and the nose. I realized that his experience of wine belonged to a world to which I had no access. I could hear the words; I had access to the reification, in this case, familiar words. But it would have taken me hours of participation in tasting and discussing tastes to be able to really understand this practice. In such combination of participation and reification, human communities create worlds of meanings, which simply do not exist for outsiders.

The story illustrates two fundamental principles about culture defined as intertwined structures of participation and reification. First, culture so defined is fractal in nature. The words my friend used were borrowed from common language and mutually understood at a different level of scale, but with very specific meanings in the context of wine tasting. Second, the structures of participation and reification are not congruent or locked in each other because people and artifacts travel differently through social systems. I had access to the words, but not to the participation that would have allowed me to understand his meaning. The words could even have been printed on a label or on the web. Conversely, had he said nothing but just blissfully drunk his glass with all the ritualistic moves, I would have missed access to the reification structures he was using to make sense of his experience.

More generally, a word or a tool may be adopted in a different community, but there is no guarantee that its meaning will be preserved or continuous in the translation. This open interpretive potential creates a diversity of signification across a system, which is essential to the dynamism of the system required for learning. At the same time, system-level learning requires some degree of continuity of meaning across boundaries so that people can learn from each other. A social learning theory needs to encompass this tension between diversity and mutual intelligibility and theorize how it affects learning capability.

Power: economies of meaning

Learning involves the ability to create new meanings. But this ability entails relations of power: to what extent do our interpretations of the world have legitimacy to ourselves and to others? In other words, to what extent does our learning become "knowledge" that can enable us to participate in the world? Therefore a social theory of learning must include a theory of power to account for the legitimacy and social efficacy of our experience of learning.[7]

Learning always takes place in the context of *economies of meaning*, where power is defined as the legitimacy of the meanings we arrive at. Note that power in this context is not defined as evil or dominating; it is an intrinsic dimension of a social learning system in which learning creates an experience that may or may not gain legitimacy.

Communities of practice are important structural elements of economies of meaning because they define areas of competence that locally confer (or refuse) legitimacy to what we learn. Actually, in my earlier work, I have defined learning as a *tension between the socially defined competence of communities and our own experience*, whichever is leading the other.[8] In apprenticeship, for instance, it is the competence of the community that molds the experience of the newcomer. Had I wanted to become a wine taster, I would have used the competence of the community to mold my experience, drinking and discussing wine with others, reading critiques and books, until my experience of wines reflected the community's competence. In innovation, it is the experience of some members that molds the competence of the community. If my friend had discovered a brand new flavor while tasting some exotic wine, he would have had to convince the rest of the wine tasters that this flavor indeed existed so that his experience be included in the competence of the community. Both cases involve struggles for legitimacy that are fundamental to learning.

But economies of meaning do not operate inside communities of practice only. They reflect the fractal nature of learning systems. A competence that has great legitimacy inside a community may not have much legitimacy outside that community depending on the position of the community in the broader economies of meaning in which it operates. Great success among your fellow gang members may not confer much legitimacy to your perspective in other contexts. And in fact, it may be counter-productive or even disempowering in other contexts.

Identity

For the purpose of this theory, I formally define *identity* as "*a learned experience of agency*" in the context of social structures. Mirror images of the five dimensions of learning systems listed above contribute to this definition of identity, making the definition complex and multi-dimensional:

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[7] The question of the place of theories of power in learning is crucial. For theorists like Michel Foucault, the issue of power is so central that it almost leads to an equivalence of knowledge and power (Foucault, 1980). On the one hand, the situatedness of learning has to be understood in the context of institutionalized forms of power, such as organizations and states, as argued by Contu and Willmott (2003). On the other hand, it is important to place the reproduction of institutional structure in the context of their interpretation in practice and the learning taking place there, as advocated by Paul Willis (1977).

[8] For the full definition, see Wenger, 1998, Coda I. This is then extended in ch. 11 to address the learning potential of systems of communities.

- *Scale*: identity, like systems, is fractal in that it is defined at multiple levels of aggregation, from the local context in which we engage to broad structures and communities with which we identify
- *Space*: multimembership is a fundamental characteristic of identity as we belong to a multiplicity of communities and yet learn to be one person
- *Time*: identity is produced in time as a trajectory, both within and across communities
- *Culture*: practices at each level of community include a discourse of the self that provides material for negotiating an identity
- *Power*: our identity is shaped by and shapes the legitimacy of our own experience with respect to the economies of meaning in which our learning takes place

Let us briefly review these dimensions as they apply to identity. The reader in a hurry can skip to page 13.

Scale: the fractalness of identity

I have argued that identity is the scale-free foundation that cuts across levels of aggregation in social systems. We can identify with our family, our neighborhood, our city, our nation, our species—all within one identity. Similarly, our identity as an engineer encompasses at once all the engineers in the world, our local team, our regional society, our engineering specialties and subspecialties (mechanical, automotive, brakes), our university degree, and the few things we consider ourselves especially good at. These levels may have different degrees of intensity or resonance. They may even conflict. Still, our identities can cover the entire fractal structure of learning systems with their multiple levels of nested communities. Our identities are both local and global in scope. In this regard, learning involves a local/global interplay in that it transforms the entire range of our identities through the whole fractal. [9]

Because the scope of our engagement and scope of our identification are not congruent, it is useful to think about the relations between learning systems and identity formation in terms of distinct *modes of belonging,* which operate at various levels of scale within the community structure of large learning systems. Those identified so far in my work include *engagement, imagination, and alignment*.[10] This project may uncover others. Various combinations of these modes result in different types of communities.

Space: multimembership

Our identities also reflect the heterogeneity of learning systems as we develop relations of participation and non-participation in multiple communities of practice. (We define ourselves by the communities we belong to, but also through communities we do not belong to—whether by choice or by exclusion). *Multimembership* is thus a fundamental characteristic of identity. Essential to the construction of identity is the ongoing work of reconciling (with various degrees of success) membership in multiple communities and our involvement in multiple relationships into the experience of being one person.

[9] The ability of individual identity to be coextensive with the whole system is a key difference between social systems and complex adaptive systems in the natural world. We participate in social systems with an image of the system that we construct through and embody in our identities.

[10] For full definitions, see Wenger, 1998, ch. 8.

Time: trajectories

Individual identities form through participation in these systems, which is experienced as a *trajectory* in and out of communities over time. Trajectory as the term is used here does not connote a simple linear path, especially in the context of multimembership. A trajectory can be very convoluted, with returns and loops. With respect to a community, trajectories are sometimes inbound, sometimes outbound, and sometimes simply peripheral. But through all these phases and changing contexts, the use of the term is meant to suggest a continuity of the person produced as an experience of identity over time—through memories, through narratives, and through social expectations that you are still the same person. Trajectories of identity place any moment of participation in the context of a personal history, which includes where we come from and where we think we are going.

Culture: discourses of the self

Each community produces a discourse of the self, which is embodied in its structures of participation and reification. This discourse of the self is both internal and external. It includes how members make distinctions among themselves and how the community defines itself in the world. Discourses of the self at multiple levels of scale are not limited to the "big" categories of identity that have traditionally been the focus of social theory (class, gender, race, nationality, ethnicity). They include the myriad ways—some inconsequential, some salient—in which the social structures we inhabit define ways of being in the world that become constitutive of our identity (nerd, sociable, good at facilitation, lurker, from the south side of town, with a sense of rhythm, etc., etc.). These discourses do not necessarily involve much reflexivity. More importantly, they do not determine identity. They provide material, embraced or resisted, for the ongoing negotiation of the experience of identity.

Power: identification and agency

Defined as a learned experience of agency, the concept of identity requires a theory of power to talk about the ability to act as an agent. Learning changes our ability to be an agent in the world and therefore involves relations of power—including competence and incompetence, participation and non-participation, centrality and marginalization. These struggles for legitimacy depend on relationships of identification, which make us accountable to the competence of certain communities. In other words, being recognized as competent only matters to the extent that one identifies with the communities that can confer legitimacy to learning. If you think that academics are full of it, who cares if they don't find you competent. Short of the threat of violence, the power they have over you depends on your degree of identification with their communities and values.[11] The very notion of community as the object of identification implies a power structure in an economy of meaning (again without assuming that power is necessarily evil, but a feature of agency). A theory of learning that focuses on identity needs to account for these relations of power, which are inherent in human existence.[12]

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[11] Even the threat of violence depends to some extent on identification. For instance, once identification with the fear of death is removed, exercise of power becomes very problematic. This is one reason groups that have overcome the fear of death, such as early Christians or some terrorists today, are such a puzzle for state powers.

[12] Conversely, I would claim that a theory of power needs to be anchored in a theory of identity to explain how power achieves efficacy (through identification) and thus why people embrace or contest structures of power (see Wenger, 1998, ch. 9). Without a theory of identity, it seems as though power has its own efficacy.

Identities and learning systems: a dual perspective on learning

Equipped with a multi-dimensional view of learning systems and identities, it is now possible to explicate better how this dual perspective is a useful way to talk about learning. Indeed, I have talked a lot about identity, some about competence, but little about knowledge, skills, and information. This may come as a surprise for a theory of learning. But I think it is a very significant move. Identity as I have defined it does include knowledge and skills, but subsumed under a "learned experience of agency," which is not solely, or even primarily cognitive. In addition to cognition it encompasses all the constituents of this experience, including our body with a specific genetic makeup, emotions, relationships, social existence, and our engagement in the world—all under interpretation as they become part of who we are. If we do not subsume skills and knowledge under identity, we are incapable of theorizing how learning can change our actual ability to participate in the world. That a skill is learnable in its mechanics does not entail that it is useable or meaningful in the context of an identity engaged in the world. It is knowledge as identity that one can make use of because it is part of who we are as an agent. That is why I choose to subsume issues of knowledge and skills under identity and focus the learning theory on providing a complex perspective on identity.

At the other end of the spectrum, I have talked about social learning systems at various levels of scale. This is because I believe that we cannot focus on learning in terms of identity without including the social systems with which identity is, so to speak, coextensive. Even if we are focused on a specific task, we do it with our entire person. Identity is not something we turn on and off. We do not cease to be parents when we go to work even if we mostly manifest other aspects of identities while there. Our identity as parent is right below the surface. Talk about a problem with children at work, and all the parents are listening all of a sudden. When we negotiate the meaning of a situation, we do it with the full range of resources within the scope of our identity, which I have argued, reflects the fractal nature of the social systems in which we live. A kid in a classroom, a worker in an office, a person watching the news on TV—all interpret what they are doing, seeing, hearing with the full extent of their identity, in scale, in space, in time, in culture, and in power. Once we move from a focus on cognition to a focus on identity, we have to include within the theory the full range of resources available to learners for negotiating meaning and producing an experience of agency.

But the reverse is also true. To theorize the learning of a social system, we have to take into account the identities that live in it. Identities and social structures reflect each other, as the dimensions suggest, but they are not locked in a mirror image. Identity is not something fixed. The ongoing work of identity always has the potential of reframing social structures. In our identities, we can stretch through the social fractal and bring the perspective of one level in another: we can "act locally and think globally," as the bumper sticker says. Our multimembership reflects the boundaries of our social systems, but we also bridge and redraw these boundaries because we are one person across them. We belong to specific generations, but we can take in the stories of our elders and share our own stories with those who follow us. As we walk through life with our identities in the making, we are constantly—in our own, partial, and largely unknowing ways—weaving and reweaving the social fabric of our societies. Our identities are the learning capability of the world.

Structural dimensions of learning capability

One aspiration of this framework is to theorize the learning capability of social systems and social actors as they shape each other. Earlier, I mentioned the definition of learning as a tension between socially-defined competence and personal experience, whichever is pulling the other. To come back to the wine example, in the tension between my experience of a glass of wine and the competence of wine tasters lies a learning potential. Similarly, in the tension between someone's experience of a new taste and the pondering of other wine tasters whether this new taste deserves to become part of the shared competence lies a learning potential. Realizing this potential depends on our ability to set up and embrace the tension between competence and experience. If experience and competence are locked in, if the experience of members always simply mirrors the existing competence of their community, not much learning takes place. The practice is stale. Conversely, if the two are too distant, not much learning takes place either: mostly what I learned with my glass of wine was that I was not a member of that community. Bringing experience and competence in tension would have taken much more interaction—and the corresponding mutual opening of our respective identities.

Placed in the dimensions introduced earlier, this definition of learning provides the ingredients for a theory of learning capability and potential innovativeness of complex learning systems. Competence and experience are in different relations at the core and at the boundaries of practices, at the encounters between generations, and in relations of power among participants. The innovative potential of a system lies in its combination of strong practices and active boundary processes—people who can engage across boundaries, but have enough depth in their own practice that they can recognize when something is really significantly new. You have to combine this with enough mobility to enable members to redirect their trajectories as emerging opportunities arise. There is a whole theory of learning capability there. All these ingredients of innovation operate in the context of the systems/identity dimensions. How are these processes affected by scale and by "practice distance"? Who can act as broker across boundaries? What are the issues and opportunities presented by generations of people and ideas? How does culture foster or inhibit encounters that reposition the competence/experience relation? What are the implications of forms and concentration of power on the learning capability of a social system?

There are corresponding questions about identity and learning capability. Just as a community becomes stale when the experience of its members merely reproduces its existing competence, so does an identity become stale when its experience becomes merely self-reproducing. We talk about the aging of the body, but we need to talk about the aging of identities, which is not determined by physical age. How does an identity become stale? How does an identity stay alive? How can we talk about learning capability, not just in terms of stages of development, which are important, but also in terms of engagement with social learning systems? Again, the dimensions provide a framework for asking questions about learning capability. How can an identity keep stretching itself across fractal levels, or dislocate itself across boundaries? How does one embrace boundaries as a developmental process? How does a trajectory become a learning asset, or a liability? What are the demands and effects of generational encounters in terms of opening identities to each other? How does one use discourses of the self as a transformative tool? How to stir the sleeping knowledges silenced by prevalent discourses? What are the implications of power for the learning of an identity? If power corrupts, does it corrupt learning—the learning of those who yield it as well as

the learning of those who are subjected to it? On the other hand, isn't learning a way to gain power? What power does it take to produce an experience of agency?

These questions about learning capabilities reveal how interlinked social learning systems and identities are. They realize their learning capability in relation to one another. This does not imply a deterministic relation. On the contrary, learning capability supposes that the two are in tension rather than locked in. Yet, theorizing the learning capability of one always has to refer to the learning capability of the other.

Functional elements of learning capability

When one is applying this perspective to the learning capability of a specific social entity (a community, an organization, a country), it is necessary to consider some functional elements of learning systems. A provisional list of these functional elements derived from work with organizations in the private and public sectors includes:

- *Performance imperatives.* Learning does not happen in a vacuum, but in the context of performance imperatives that give it direction. These expectations of performance may come from the outside or be internally driven; they may be broadly shared or the topic of much conflict. They may be instrumental to survival or to some other material goal, but not exclusively. With the focus on identity, much of what a social learning system is about is personal, interpersonal, and cultural. It is nevertheless essential to give a central place to performance imperatives in the functional picture of a learning system. What are the demands that social systems and their members have to respond to? What are the processes by which these demands are expressed (market mechanisms, cultural aspirations, mandates, personal quests, etc.)? Where are the production systems that realize the performance imperatives of the learning system? What are the activity systems, the division of labor, and the productive practices that organize the performance of the system? How are the learning and the performance systems coupled?
- *Social fabric.* The performance imperatives operate in a social system held together by a set of relationships. Our ability to learn individually and collectively in response to these imperatives depends on the quality of these relationships. What is the overall quality of relationships across the learning system? How much of the network is based on transactional relationships as opposed to enduring mutual commitment? Are there strong notes of mutual commitment? How easy is it to cross boundaries? What is the nature of citizenship within the system? What are mechanisms of cooperation and competition? What are the norms of behavior? How productively can the social fabric handle differences and conflicts? What factors can affect the quality of the social fabric?
- *Governance*. Learning is not a neutral issue, but a political one highly prone to controversy. Because learning entails "improvement," what constitutes learning depends on an interpretation of improvement: what some view as learning may be regressing to others. This is true of both system-level and individual learning. How does a system and its members come to interpret performance imperatives, translate them into learning imperatives, and direct efforts and investments accordingly? How does the system deal with disagreements? How does it orchestrate knowledge-producing processes and evaluate learning? To what extent does learning itself become part the system's imperative? Who develops a view of the system's learning capability and cares for it? What forms of leadership are present or required?

- *Institutionalization/codification.* To what extent does a learning system translate its own learning into artifacts (tools, documents, procedures, etc.)? This includes codification of knowledge that reifies the results of learning into artifacts. It also includes the institutionalization of performance imperatives, standards, norms, methods, policies, and roles, which reify processes and define the learning systems structurally and functionally. What are the processes of codification and institutionalization? Who does it? With what authority or consultation?
- *Education.* How explicit is the process of enabling learning trajectories through a system? All learning systems make some trajectories more likely than others, but not all have specialized functions for this purpose. What kinds of facilities exist for shaping trajectories? How does these facilities translate overall learning imperatives into local participation imperatives (e.g., schooling requirements, curriculums, tests, degrees)?

It is important not to confuse these functional elements of learning systems with the institutions that are most visibly set up to address them. For instance, countries have governments whose overt role it is to perform governance functions. But the range of governance requirements and functions within the learning system is not necessarily restricted to government officials. Actually, today, the proliferation of NGO's and foundations in many countries reflects governance functions at the learning level that expand well beyond the confines of government institutions.

These functions vary along the dimensions listed earlier. For instance, a function at one level of scale does not necessarily propagate to other levels. A policy within a company is not necessarily that of its industry, nor is it necessarily something that groups inside the company adopt, value, or adhere to uniformly. The same could be said of a performance imperative translated into a strategy. Crossing structural and functional dimensions will be central to the task of developing a framework for theorizing learning capability in social systems.

To keep these levels in perspective, it is useful to organize the investigation of learning capability around the boundary of a given institution. For instance, a school may have a well-defined function within the learning system of society, but this says nothing about the quality of its internal learning system. (Many schools do not do a very good job of enabling learning trajectories for their teachers, for instance.) Similarly, a government may take a strong hand in the political governance of the country and yet may be completely disorganized with respect to the governance of its internal learning systems or pay no attention to the country as a learning system. More generally, given a social entity—be it a community, an organization, an association, a region, or a nation—the theory's interplay of social structures and identities yields a two-tiered framework for exploring learning capability. The entity's boundary needs to be considered at the learning-system level:

- *How does the entity organize itself as a learning system?*
  Focusing on the internal structure, how to enable a projection of learning imperatives into fractal community structures that can deliver the necessary capabilities.[13]

[13] The first question has received the most attention in research literature and in practice under the learning label (Argyris and Schon, 1978; Senge, 1994; Wenger, 1998; Garvin, 2000) and under the knowledge label (Dorothy Leonard, 1995; Nonaka and Takeuchi, 1995; Davenport and Prusak, 1998; Wenger et al., 2002; Saint-Onge and Wallace, 2003), though I believe we still are at the beginning of the learning curve, and we need more examples.

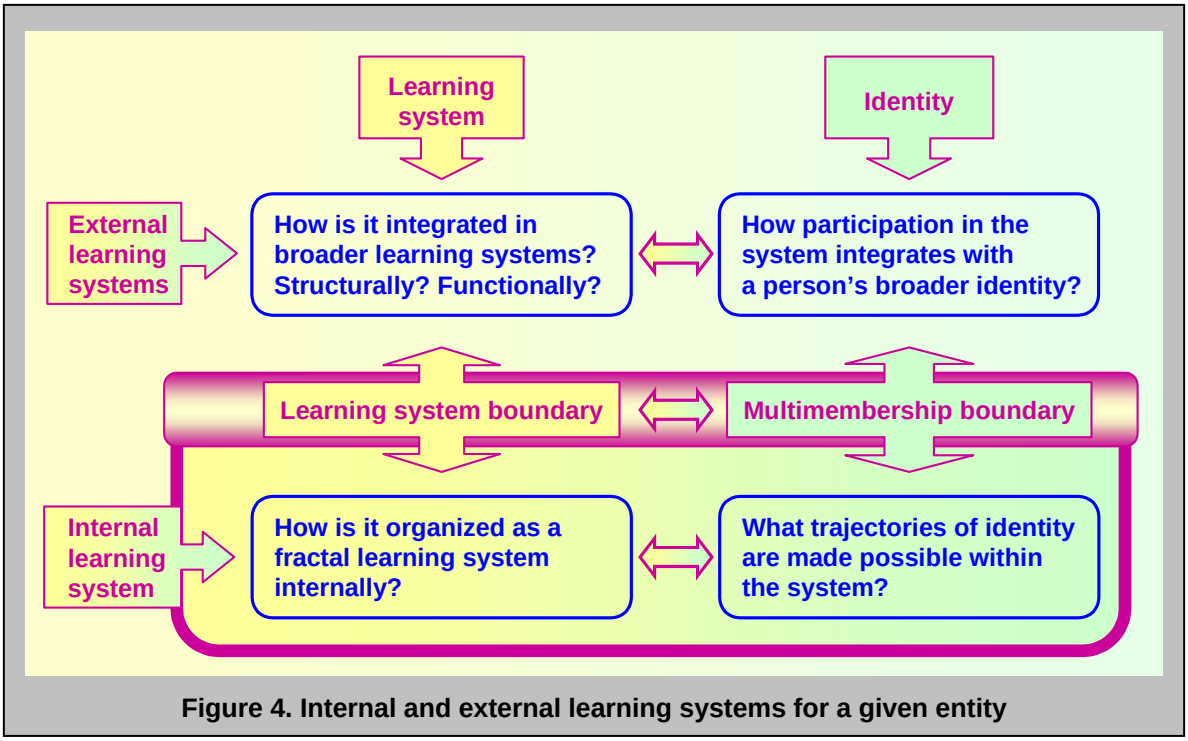

Figure 4. Internal and external learning systems for a given entity

- *How does the entity integrate in broader learning systems?*
  Focusing on the boundaries between learning systems, how to participate in broader learning systems, and how to interact productively with other entities?[14]

Considering individual trajectories yields two further symmetrical questions focused on identity:

- *How does a learning system enable or shape trajectories of identity?*
  What kinds of trajectories are possible through the system, inbound, peripheral, outbound? How is multimembership made possible?
- *How does internal participation relate to broader trajectories of identity?*
  How does participation in a system play out in the broader identity that people build in the rest of their life? Is it easy to reconcile? Are the two in conflict?

Figure 4 is an attempt to represent these relationships graphically. Note how learning system and identity interact in multiple ways:

- internally: participating in the system
- at the boundary: living and bridging the boundary, bringing things in and out
- externally: being associated with an entity in the eyes of the world

Note also that the four questions in the figure repeat themselves at each level of scale. So they are a way to explore learning capability recursively within learning systems.

[14] This question is starting to attract the attention of researchers and practitioners: upstream learning networks (Dyer and Noboeka, 2000), value webs (Allee, 2002), knowledge exchanges laterally and downstream (von Hippel, 1988, 2002); and industrial clusters as "rails of practice" (Brown and Duguid, 2000). See also Gibbons *et al.* (1994) for an analysis of the emerging, distributed systems of knowledge production, which involves new kinds of collaboration across sectors. Annalee Saxenian (1996) argues that functioning as a regional learning system is a key to the success of Silicon Valley as a thriving and innovative high-tech cluster.

A social theory of learning: identity and learning systems

In this section I have presented a broad outline of the theoretical framework as I see it shaping up. There is still much work to be done to make it coherent, robust, and useful. Are the dimensions, modes of belonging, and functional requirements outlined here the right ones? Are they the minimum set? Are some missing? How do all these elements interlock and how do they fare in the face of data? How useful are they in explaining learning capability? These are the kinds of question that the theoretical part of the project will work on.[15]

Still, this proposal should give the reader a reasonable sense of the general direction of the theory. In summary, bringing learning and social theory together is useful to both enterprises. Learning theory gains the ability to focus on the production of meaningfulness, not just the mechanics of skill acquisition. It can do this by locating learning within our engagement with social systems that provide tools and context for negotiating meaning.

- On the one hand, learning is subsumed under identity, which becomes the crucible in which our bodily, emotional, cognitive, and social existence produces an experience of agency.
- On the other hand, learning is also a property of social systems at various levels of scale, from our local communities to the entire world. These evolving systems provide material for constructing identities, and at the same time derive their learning capability from the identities they enable.

Learning theory can apply all the sophistication of social theory to theorize this interplay between identity and learning systems along multiple dimensions, including scale, space, time, culture, and power, and in the context of functional requirements such as performance imperatives, social fabric, governance, codification, and education.

Social theory in turn gains an ability to frame the production and reproduction of social structures in terms of learning in everyday life. Mid-level concepts such as communities of practice make it possible to talk about the production of social practices within the scope of engagement of people and to view social structures as fractals in which learning processes structure the social world at multiple levels at once. Finally, this approach focuses on the learning capability of social systems, which has not been addressed systematically so far, but which I believe needs to become a major concern in social theory today.

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[15] Expanding the scope in the directions described in this section will also entail the integration of elements from a number of other theories.

- *Embeddedness of learning systems*. On the one hand, it will be necessary to explore how learning systems interact with broader structuring elements of social systems. Examples of issues and authors include historical periods and institutional structures (Michel Foucault, Anthony Giddens, David Harvey), social stratification (Pierre Bourdieu), complex social systems (Niklas Luhmann), network society (Manuel Castells), historical activity systems (Yrjo Engestrom), institutional settings (Jean Lave), organizational culture (Joanne Martin), etc.
- *Embodiment of identity*. On the other hand it will be necessary to include the part that individual experience plays in structuring identity. This will connect with other theories that deal with individual physiology and psychology, for instance, theories of intelligence (Howard Gardner, David Perkins, Daniel Goleman), personal development (Erik Erikson, Robert Kegan, Carol Gilligan), social identity theory (Herbert Mead, Erving Goffman, Anselm Strauss, Penelope Eckert, Leigh Star, Ken Gergen, Sherry Turkle), evolutionary psychology (Steven Pinker), personal experience (Mihaly Csikszentmihalyi), biology of cognition (Humberto Maturana and Francesco Varela, Fritjof Capra), etc.

2. Learning trends: an emerging portrait

The second component of the research agenda focuses on learning trends. The goal is to perceive, articulate, interpret, and elucidate emerging trends with respect to learning in the world today. The purpose of focusing on trends is threefold:

- *Theory*: to illustrate, test, and expand/refine the theory by using it to explore the state of learning in the world today
- *Social commentary*: to produce a useful, cross-sectoral portrait of learning at the beginning of the 21st century
- *Context for action*: to set a concrete context for the implications for action, design, and institutions, which are the focus of the third component of the research project

As illustrations of the kind of trends I would like to explore I outline four candidate trends that I have been observing and could serve as initial working hypotheses for the project. The first two focus mostly on the system level:

- *Horizontalization of learning*: a shift in our a view of knowledge communication that emphasizes less the vertical relationship between a producer and a recipient and more horizontal interactions required for the negotiation of mutual relevance
- *Partialization of learning imperatives*: the complexity of knowledge domains creates relationships of interdependence so that learning increasingly means being part of broader systems and learning to participate productively rather than mastering everything oneself

The next two focus mostly on the identity level:

- *Personalization of value creation*: the need for personal engagement in work as a key to creativity and knowledge-related activities
- *Individualization of trajectories of identity*. Identity becomes an individual experience when it involves complex multimembership. This individualization is reinforced by a number of related trends.

There will no doubt be others, and these may turn out to be misconceived, but they will give the reader a sense of what I hope to accomplish.

The "horizontalization" of learning

Learning is traditionally viewed as a vertical process that involves a producer giving knowledge to a recipient. From this "vertical" perspective, theory is often considered a superior mode of learning. Practice then is a derivative of theory, an application that follows learning. But practice is making a comeback. Rather than a derivative of theory, practice is beginning to be considered an equal partner. The focus on practice does not mean that theory is dismissed or even devalued. It entails on the one hand that the production of theory is understood as a particular practice (e.g., recent trends in the sociology of science[16]), and on the other that reflective practice is understood as a source of theorizing (e.g., distributed modes of knowledge production[17]; action-research methodologies[18]).

[16] See Latour and Woolgar (1979).

[17] See Gibbons et al. (1994).

[18] See Argyris et al. (1987).

This focus on practice affects how we understand learning. The vertical view seems to be giving way to a more horizontal view, a process involving negotiation among learning partners. At first I was struck that so many companies are interested in cultivating communities of practice as a way to manage their knowledge. Communities of practice are by definition structures that enable peer-to-peer learning among practitioners. They are horizontal structures. And they place the responsibility for managing knowledge in the hands of practitioners. This in itself is quite remarkable. In most interpretations of taylorism, knowledge is the property of vertical management structures that extract it from practice to manage it from above. By contrast, fostering communities of practice to manage knowledge horizontally is turning taylorism on its head.

This emerging phenomenon of horizontalization seems to be quite widespread. One effect of the internet is also to enable horizontal connections. People share files. They engage in conversations across hierarchies. They build blogs as a way to publish their ideas directly and establish knowledge-sharing (and indeed knowledge-producing) networks. Some development specialists are starting to explore the use of communities of practice as a way to "horizontalize" the exchange of knowledge along the north-south axis, by bringing together local practitioners and research scientists. It is not so much a matter of democratization for its own sake as it is a matter of effectiveness of knowledge exchanges in practice.

This horizontalization trend does not suggest that issues of power disappear. Communities involve experts and novices with different degrees of influence and legitimacy. Blogs compete for popularity ratings. But even when a transaction involves the meeting of an "expert" with a "client," the relationship is starting to be understood as a "horizontal" one. Progressive doctors are attempting to reconceptualize the medical consultation, not as an expert providing a service to a recipient, but as the meeting of two forms of knowledgeability that have to meet and negotiate how they inform each other. Doctor are still doctors, but the process of making their expertise effective requires this horizontal exchange.

In all these examples, the central theme is the *negotiation of mutual relevance* of different forms of knowledgeability as key to the production and transfer of effective knowledge. Peers negotiate with one another how their respective stories are relevant sources of knowledge for each other's situation. Doctors negotiate how their advice fits in the perspectives of patients. Scientists negotiate how their discoveries can contribute to the practices of local farmers. Horizontalization is the key to ensuring the meaningfulness of the exchange.

The "partialization" of learning imperatives

The increasing complexity and diversity of domains of knowledge entails an increase in interdependence among people and among groups of people. Even within a specialized domain, there is too much to know, too much new knowledge being produced too fast for any one participant to claim exclusive ownership or full mastery of the domain. Learning is learning to take part in the broader ecology of a learning system. When the learning imperatives operate at the level of learning systems, learning for participants involves an experience of "partiality," that is, of being only one *part* of a larger process.

For individuals, learning increasingly requires learning to participate in learning systems. Knowing is being able to participate in these complex systems rather than owning the

entirety of the domain of knowledge under consideration. One's own knowledge is always partial, and appreciating this partiality is essential to being able to contribute. "Engaged partiality" becomes the main challenge and the way knowing manifests. From an identity standpoint, partiality is a different relation to a domain than simply knowing or not knowing. You know your part, but because your partiality is engaged, in practice you know more than you know.

Organization increasingly find themselves implicated in "value webs" in which learning imperatives expand beyond their boundaries. Businesses need to learn from and with their customers. They need to include their suppliers in their knowledge-sharing networks. They engage in joint ventures with their competitors as a way to explore new technologies. Increasingly, firms have to participate in broader learning systems—industries, regions, alliances, consortia—with multiple players including their competitors, as well as more traditional sources of knowledge such as universities and research labs. Participation in these systems is essential for keeping abreast of fast technological developments. If sustained success in a knowledge economy depends not only on effective participation in economic markets, but also depends just as much (and with many of the same players) on knowing how to participate in broader learning systems—industries, disciplines, regions—then a central characteristic of the knowledge economy is the blurring of competitive and collaborative relationships. Firms that compete for market share combine expertise through alliances and joint ventures. They compete to recruit and retain talent, yet the movement of people promotes the circulation and development of new ideas. They sell competing products and services, yet they belong to the same learning systems, where they develop crucial knowledge, find the seed of new ideas, follow technological developments, and establish common standards.

The rules of participation in learning systems are different than those of product markets, because reciprocity is at the heart of how mutual learning functions. If you hoard your knowledge, you quickly gain a reputation of taking more than you give, and you will progressively be excluded from the most significant exchanges. This is true of organizations and of individuals who may participate in a community of practice. A paradox of the knowledge economy is that when it comes to learning, your most threatening competitors are likely to be your best partners.

The "personalization" of value creation

Today's economy places an increasing emphasis on knowledge and innovation as a source of value creation. But creativity is a voluntary act of engagement with a problem, which cannot be designed or prescribed in the way that a routine action can. In a traditional industrial setting, the formal design of a production system is the primary source of value creation. Think of an assembly line where value derives from the quality of the design of the formal process—division of labor, coordination, efficiencies, just-in-time inventories. Informal processes still exist, but they produce value to the extent that they conform to and serve the formal design. In the knowledge economy, this relationship is inverted. The primary source of value creation lies in informal processes—conversations, brainstorming, meaning making, and pursuing ideas.

In an industrial setting, you may have been able—and even this is debatable—but you may arguably have been able to ask people to leave their identity at the door: hang it on the clothes rack, put the bolts on the wheels, and at five o'clock, put your identity back

on and go live your life. In a knowledge setting, the engagement of one's identity and sense of meaningfulness in a situation is what gives rise to creativity and knowledge production. It is the person as a whole that matters. It is the aliveness of the engagement of people's identity with the task at hand, which cannot be fully formalized. Formal organizational designs and processes still have a role to play, but they contribute to value creation to the extent that they are in the service of informal processes. This gives rise to a paradox of organizational design: the formalization of organizational systems is successful to the extent that it enables informal systems. Dependence on knowledge and creativity gives rise to a shift in the primary source of value creation—from formal systems to personal engagement as the primary source of value creation.

Another consequence of the personalization of value creation is a shift in the ownership of the means of production. This personalization reframes some fundamental principles of labor theory. In a traditional economy, capital owned by organizations provides the "means of production" (tools, plants, energy) and employees sell their labor as operators of the production system. In a knowledge economy, the picture is much more complex because knowledge capital cannot be fully owned by organizations. Talented practitioners consider their expertise to be a personal characteristic tied to their sense of meaning and identity, not merely as an organizational asset that is owned by their employers. They take personal responsibility for developing this expertise as a way to further their professional trajectory. Increasingly this trajectory is understood and shaped in terms of personal identity and allegiance to their craft rather than allegiance to a firm. In a knowledge economy, these professionals own a large portions of the "means of production," the ability to produce knowledge (expertise, intelligence, creativity). This ability walks out the door every evening. It can go elsewhere if the demand for talent is high enough or if it finds more interesting challenges and developmental opportunities.

In traditional labor theory, employers want as much labor as possible for as little wage as possible. Employees want to give as little labor power as possible for as much wage as possible. The ability to produce knowledge, unlike traditional labor power, does not wear out with use. Instead, it increases with use. Employment relations are therefore becoming a kind of temporary "knowledge partnership."[19] Organizations are successful in talent markets to the extent that they offer better knowledge partnerships than knowledge workers would find elsewhere or by striking out on their own. Competing in talent markets by offering attractive developmental opportunities does create a vexing paradox for employers.[20] You attract people by offering to contribute to the development of their professional trajectory, but in doing so you make them more desirable in talent markets. In other words, you retain people to the extent that you enable them to leave.

That both employer and employee have a stake in putting knowledge to maximal use does not mean that their interests are fully aligned. The developmental aspirations of the knowledge worker may still be at odds with the needs of an organization. The projects that sell may not be the ones that you want to work on. The idea you want to pursue may not have enough short-term pay-off. Still, for professionals, this personalization of value creation places an emphasis on personal development. Learning becomes a primary objective that ensures one's marketability. Meaningfulness of engagement is crucial for

[19] See Malone and Laubacher (1998), and Reich (1998).

[20] Organizations of all kinds participate in talent markets. Increasingly, they have to compete for employees who can contribute their ability to produce knowledge. For many high-tech organizations, recruiting and retaining talent is a more daunting challenge than competing in commercial markets.

unleashing the creative potential of the individual. Work and identity have to serve each other in the context of a personal trajectory.

The "individualization" of trajectories of identity

I have argued under the theory section that in a complex society, the issue of identity becomes more individual because each person becomes a unique intersection of forms of participation. Because our set of multimembership is so unique, because the social contexts in which we define our identities are so diverse, we do not have companions who share our trajectory. So while the trend of partialization may suggest that individuality dissipates, the theory predicts that, paradoxically, it is actually the opposite that happens. I think that data will actually bear out this hypothesis, though the research still has to be done. While the anachronistic "universal knower" à la Leonardo da Vinci is replaced by teams and communities of "partial knowers," we also see individual identity becoming a "project" that occupies center stage in society.[21]

A number of simultaneous trends contribute to this process of individualization—though it is not easy to determine which are causes and which are consequences. The personalization of value creation is certainly one factor. Furthermore, traditional institutions of identity—nations, work organizations, formal associations—are losing their exclusive empire on the definition of identity. We are no longer primarily of a nationality, devoted to a company, or member of a professional association. Our identities have always been complex, but the empire of broad, overbearing institutions of identity has masked this complexity to a large extent. Today, multiple connections openly struggle for shaping our identity, in particular, shifting forms of engagement with groups defined at multiple level of granularity (owners of a brand of cars, a support group meeting once a week, a music group or a sport team fan club, an online discussion).

An individualized sense of trajectory becomes increasingly driven by a developmental thrust: community participation is less determined by geographical collocation or institutional affiliation than by our interest and potentially our learning needs. Technology and globalization contribute to this trend. Our identities determine which communities we belong to and are in turn defined by these forms of intentional, learning-driven (multi)membership.

In addition, a number of related trends also contribute to placing identity at the center of learning issues in the 21st century:

- *Information is becoming more accessible.* Access to information, a central challenge for earlier institutions of learning, is less and less a problem. If anything, there is an overwhelming plethora of information. The more salient issue now is how to forge an identity that can navigate productively a growing sea of information. Our identities guide our choices of focus and our accountability to the knowledge of myriad of communities we enter in contact with.
- *Peripherality is a generalized experience.* We are able to witness more practices without being a member of the community. We have countless service encounters, in which we witness practices as customers of our lawyers, doctors, financial advisors,

[21] Anthony Giddens (1991) claims that what he calls the "project of self-identity" has increasingly become a topic of institutionalized reflexivity as evidenced by the proliferation of self-help literature. The post-modernist notion of the "decentering" of the subject is therefore only a partial account of current trends, which must be interpreted as a paradox combining increasing partiality and individuality.

hairdressers, specialized stores, etc. We watch films and television, which show us everything from live open-heart surgery to comedies about emergency rooms, exotic healing practices to police watch. We lurk on web-based conversations among aficionados. This generalized peripherality affects the proportion of deep to peripheral participation as constituents of our identities.

- *The half-life of knowledge is getting shorter.* Human knowledge is evolving so fast, and our own trajectories go through such transformations, that much of what we learn will be relevant for only a limited time. As much as *what* we know, what matters is *how* we know—knowing with an identity that is ready to unlearn and relearn constantly in order to move on.
- *Canons are being destabilized.* Even as globalization creates homogenizing trends, it also brings into contact a great diversity of cultures. Even within cultures, new voices are struggling to make themselves heard. What constitutes our common cultural heritage is less and less obvious, but increasingly contestable and contested. Holding such a diversified society together requires less a common heritage than a willingness to engage and learn across boundaries. Again, this ability depends on identities able to manage the insider/outsider tension of boundary experiences.

Learning in the 21st century will be mostly about identity. There is talk of an information society, of a knowledge economy. I claim that the society we are moving toward would better be called the "identity society," because identity will be the main concern of its citizens and by extension its institutions. I believe that *the 21st century will be the century of identity*.

Trends and patterns: an emerging gestalt?

Trends in learning depend on a number of factors (economic, political, cultural, technological), which from a different perspective may be considered trends in their own right. The trends I have described here illustrate the level of generality at which I believe the notion of a "learning trend" should be. Establishing a trend requires a detailed study of how it manifests in different settings, sectors, regions, and cultures. It is also important to pay attention to counter-trends, such as the rise of fundamentalism as a possible reaction to horizontalization and individualization, or the global movements of capital as a counter-trend to personalization. And it is important to recognize that many of these trends are not experienced to the same extent, and with the same capability for action, across the globe. It is one goal of the project to sort this out in order to paint a portrait of learning in the world today.

Furthermore, placing a detailed study of trends and counter-trends in the context of an evolving theory may show them to be part of an overall gestalt. For instance, the trends I described all seem to point toward the importance of focusing on meaningfulness: the mutual negotiation of relevance, the sense of participation in broader systems, the investment of the self in work, the development of a personal trajectory. The hope is to be able to make sense of broad shifts or social movements whose emergence is brought to light by the theory.

The picture of learning painted by trends is crucial if one is interested in the implications of the theory for action, design, and institutions, the topic of the next section. The purpose of looking at trends and attempting to perceive broad, long-term patterns is not to predict the future. It is to create a dynamic picture of learning in the world that can free

our vision from the tyranny of the present.[22] Such a picture creates a broader context for thinking creatively about increasing our learning capability. It provides an outpost from which to take a fresh look at institutions and their role in society. Understanding trends is thus a way to ensure that our conclusions about action, design, and institutions use the theory in ways that are relevant to our times.

3. Learning implications: action, design, and institutions

In addition to revealing trends and making them interpretable, the theory should also suggest implications for action. The third component of the research agenda is to explore some of these implications, combining them with the trends to contextualize them in a contemporary setting. This creates a future-oriented picture of learning that can be used to frame a set of questions about the role and design of relevant institutions.

In the dynamic and interdependent world in which we live, learning capability is becoming as critical as knowledge. A main goal of institutional design then should be to increase the learning capability of the system and its constituents. Yet, many of our institutions are designed for knowing rather than learning. Business organizations are designed to deploy knowledge for market success rather than to participate in learning systems. Governments are designed to produce and enforce policy reflecting our best knowledge rather than to orchestrate large-scale learning systems. Schools are designed to teach what we know rather than to contribute to new learning capability in students and in society. While deploying knowledge is important, it tends to depend on a stable context. Developing learning capability is an additional design dimension, whose importance is likely to increase. The orchestration of large-scale learning systems with the goal of maximizing both the learning of the system and the developmental opportunities of individuals is going to be one of the central societal issues of the 21st century.

In this section, I will briefly look at four societal institutions: organizations, civil society, governance, and education. These make sense as they correspond more or less to functional elements of learning systems in general (listed toward the end of the theory section). As such, what I say about them is relevant at multiple levels. For instance, what I say about governance is relevant for the role of government from a learning-system standpoint. But it would also be relevant to management in an organization in so far as the role of management is to cultivate the organization's learning system.

I will not attempt to be exhaustive or even-handed. As for the trends, and even more so, the following examples are only given as illustrations of where I would like to see the project going eventually. The research has not been conducted yet, and my speculations about the theory's implications are no better than anyone else's. But with this caveat, my experience is that seeing some examples of possible implications and questions derived from the framework for actual institutions really helps. It makes the aspirations of the project more concrete, even if the exploration is still mostly speculative at this point.

[22] This is a characteristic that trends study shares with scenario planning (Schwartz, 1991), but trends are less specific in terms of images of the future.

Organizations: institutionalizing performance imperatives

Historically, business organizations were the first to embrace the notion of communities of practice as a useful perspective to focus organizational design on learning capability. We have gained many insights from the experiences of these leading organizations and of the four example areas I will cover in this section, this is the one where most progress has been made. Now organizations in other sectors are catching up—government agencies,[23] hospitals, non-profits, foundations. But the dynamism and urgency of the business world still makes it a leading player in exploring the institutional design of learning systems. What does an organization look like if viewed as a learning system? The theory's dimensions and learning-capability questions combined with the trends outlined so far provide the beginning of a framework to address this question.

One of the main purposes of organizations is to institutionalize a specific set of performance imperatives. Business organizations respond to market demands. Government agencies implement legislative mandates. Non-profit fulfill a charter. At the same time, organizations have to make sure that they develop the capability to achieve their performance expectations in a sustained fashion. Because the tasks and the structures dictated by performance imperatives such as market demands or legislative mandates are usually not fully aligned with developmental needs—of either individuals or organizations—there is a need for structures focused on organizational capability and professional development. Communities of practice have been found useful in this regard because they engage the practitioners themselves in the process of stewarding their learning. They increase the learning capability of the organization in a way that is closely connected with performance because they involve the same people.

Interestingly, by emphasizing peer-to-peer learning among practitioners, communities of practice reflect the trends described in the last section. Communities create *horizontal* connections, which enable practitioners to learn from what to them often has very immediate relevance: each other's experience. This allows practitioners to rely on each other to know all there is to know in complex domains (*partialization*). To do this, communities depend on personal engagement. Teams do too, but in the service of formal tasks defined by the institution. Communities of practice push the *personalization* one step further: their coming together in the first place depends on identity, passion, relationships, and a mutual commitment to a domain of knowledge. Finally, as platforms for professional development, they serve the practitioners *individual* trajectories, beyond the specific demands of a job. This last point becomes particularly important in consideration of new relationships of employment in which moving along a developmental trajectory is a primary aspect of the employment contract. How can community structures become platforms for the development of professional identities within and across organizations?

While the very characteristics described by these trends make communities of practice ideal for stewarding knowledge, they also make them a challenge for traditional hierarchical organizations. One of the key challenges for increasing learning capability is how to combine hierarchy with a community structure capable of managing knowledge. Formal systems, which tend to be vertically oriented, need to coexist and interact productively with the learning system, where different kinds of relationships prevail. The

[23] For a report on communities in the US Federal government, see Snyder and Wenger (2003) and for a detailed case study at Health Canada, see Wenger (2003).

challenge then is to design the organizational structures and develop the management practices that support and foster horizontal connections and personalized engagement. Here are five bridging structures that have helped couple the production and the learning systems in both private and public organizations:

- *Strategic structure*. Turning organizational strategy into learning imperatives that are amenable to personal engagement by practitioners acting as communities.
- *Sponsorship structure*. The new roles that executives have to fulfill in linking communities with the formal structure through two-way connections that honor the integrity of each.
- *Support structure*. Logistical and educational support, leadership coaching, and technological infrastructures that help communities of practice function in organizational contexts.
- *Knowledge-oriented accountability structure*. Regimes of accountability that are specifically oriented to knowledge and are distinct from traditional performance accountability, for instance, the accountability that practitioners feel towards each other to provide help and advice, or the responsibility that a community takes towards warranting its knowledge output.
- *Reputation structure*. The formal and informal mechanisms by which knowledge-oriented contributions come to serve the trajectories of participants, including recognition by peers, by the organization, and beyond.

Much is at stake in the productive interaction between the learning system and the formal organization institutionalizing performance imperatives. Market success requires depth of knowledge in strategic domains, but this investment in depth of knowledge can often result in what Dorothy Leonard calls “core rigidities,” an investment in deep capabilities that makes it difficult for the learning system to respond rapidly to changes in performance imperatives.[24] This investment is not merely a matter of resources and habituation, but also an investment of identity, which needs a meaningful trajectories onward. Conversely, market success brings along an investment in servicing the market that can make it difficult for performance systems to respond rapidly to learning systems. Clayton Christensen observes that market leaders very rarely remain leaders when a disruptive technology shakes an industry. In what he calls the “innovator’s dilemma,” he notes that even when the learning system of a successful company has kept up with the new technology, the performance system is so invested in its market success that it is almost impossible to incorporate the innovation within existing structures. He suggests that the only way to enable the learning system is to create a separate performance organization free from the constraints imposed by soon to be obsolete market success.[25]

While the first wave of interest in communities of practice was for the internal learning systems of organizations, the learning imperatives of increasingly complex and dynamic knowledge domains pushes organizations to consider more intensely how they can participate in broader learning systems. How are they managing boundary processes in the context of learning systems such as value webs, industrial clusters, and regional networks? How can they combine competitive and collaborative relationships? What if an industry as a whole becomes the primary learning system? What roles can horizontal structures such as communities of practice play in providing inter-organizational learning platforms?

[24] See Leonard (1995).

[25] See Christensen (1997)

Civil society: the social fabric of learning

The issue of learning capability in civil society is much less well-defined than in the case of organizations with explicit performance imperatives. What there is to say is much more speculative, not only because I have less personal experience but because the topic is more complex to start with. Most of the talk about community building in civil society concerns political activism rather than learning capability. Yet I believe that civil learning capability is a topic that will need much attention in years to come and one to which I hope the theory proposed here will contribute useful insights. How can we consider civil society from a learning-systems perspective?

Social theorists have long been concerned about the social fabric in civil society as a counterweight to the competitive and contractual relationships of the marketplace.[26] Recent work by Robert Putnam documents trends toward a loss of "social capital" with implications for indicators such as economic prosperity, health, and democracy.[27] What are the implications of this research for societal learning capability?

In the world today I see contrasts between approaches to civil society that place a large emphasis on social consensus (as in many European countries) versus those that place more emphasis on transactional relationships (as in the U.S.). My experience as a European emigrant to the U.S. is that these two perspectives lead to a lack of mutual intelligibility that blinds each side to the learning capability engendered by the other. One could surmise that an extreme communitarian approach that takes social consensus to be the only source of cohesion would inhibit learning capability by discouraging initiative and entrepreneurship. Likewise a purely transactional approach, which assumes no social consensus except for the legal commitments regulating transactions, would not be conducive to dialogue and trust required for developing learning capabilities. Is it possible to talk about the learning-capability implications of these approaches or of different degrees of balance between the two?

How much can civil society learn from the experience of organizations?[28] Would it be possible to foster similar horizontal communities, both locally and globally, which would provide enough meaningfulness to engage people and enable them to address issues of importance to them? Would fractal community structures integrate regions into globalizing systems without losing a sense of local uniqueness? Would they create meaningful identities of citizenship at various levels of scale? Would they enable boundary-crossing interactions to become a force for cohesion that avoid the two extremes of consensus and transactional relationships?

These are good questions about the learning capability of civil society derived from the theory's community-structure perspective. But admittedly, the theory may be confronted

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[26] This goes all the way back to early distinctions by Ferdinand Tönnies (1887) between Gemeinschaft (community) and Gesellschaft (society) and work by Emile Durkheim (1893) on "organic versus contractual solidarity" and the status of the individual under increasing division of labor (Giddens, 1971).

[27] See Putnam (2000). This view of social capital as a "common good" contrasts with Pierre Bourdieu's view of it as a source of distinction (1980). There are clear connections between social capital as defined by Putnam and learning capability in organizations (see Cohen and Prusak, 2002), and a community of practice is a social structure where learning and social capital depend on each other (Wenger at al., 2002); but these links need to be explored further at various levels of scale.

[28] For an initial discussion of community-based learning systems in the civic domain, see Snyder and Wenger (in press). Conversely, the notion of citizenship in civil society can point the way to the relationship between members and organizations in a knowledge economy (see Manville and Ober, 2003).

with a greater challenge. If trends like individualization and generalized peripherality intensify, does there come a point where it no longer makes sense to approach civil learning systems in terms of community structure? Does participation become so fluid that communities do not have enough salience or sustainability in people's lives to be key elements of identification, as opposed to transactions and relationships? Should the notion of a fluid networked identity then become the primary foundation for analysis? Would this change the theory? Such questions are central to the nature of civil learning systems, and to contemporary social theories of learning more generally. They will certainly be central questions of the research project.

Governance: emergence and stewardship

The role of governance structures is typically approached from a political perspective in social theory, that is, from the perspective of relations of power.[29] A learning theory does not replace this perspective (learning is itself political, I have argued), but adds the dimension of learning capability as a central concern for governance structures. From this perspective a key function of governance structures is to *maximize the learning capability of the social system*.

For instance, assuming that along the time dimension, learning always involves a need to deal with uncertainty, one could posit that a governance principle for social learning systems would recommend some degree of distribution of risk as a way to encourage experimentation. Then, from a learning-system standpoint, venture capitalism could be conceptualized as a market-based process for making successes pay (in the form of high return) for the failures necessary to the learning of system as a whole.[30]

Another key learning-based governance principle is what I call the "yoking of independent learning experiments." This principle would go something like this:

- If a uniform policy imposes compliance on all the localities, the learning capacity of the system is decreased because there is little experimentation (at least of a visible and sharable kind).
- Conversely, if everyone just does whatever they want, the learning capacity of the system is not fully achieved because risk-taking and learning remain local.
- If by contrast, a central governance entity makes sure that a network of independent learning experiments are yoked together with appropriate support, communication channels, and distribution of risk, then the learning capability of the whole system and of the parts is increased. The yoking does not homogenize, but it does generate some learning interdependence among the participants.

Examples of this principle are communities of practice convened by the US federal government to connect cities across the country around issues such as gun violence or children health.[31] In a federal system, the political view of government is a division of turf along the scale dimension between central and local governments. You have jurisdiction

[29] Views of governance range from instrument of class domination to benevolent enforcement of the moral consensus of a community.

[30] There are of course other perspectives on venture capital investment, ranging from exploitation of labor to shortsighted gambling, all of which suggest a cost to society. But when weighing the cost/benefit of a function like this, it is important to consider its "learning" role.

[31] See Snyder and Briggs (2003) for the detailed story. This paper also discusses a shift in perspective from government as an institution to governance as a learning-systems property of civil society.

over this and we have jurisdiction over that. This makes sense politically. From a learning-systems perspective, however, the yoking of learning experiments constitutes a new role for a central government, which is neither policy nor laissez-faire. It is to bring resources and connections that knit the learning systems across localities. This is especially relevant today when most urgent problems do have this multi-scale nature and typically cross levels of government: urban issues, education, health, terrorism.

Note that this role of maximizing the learning capability of a social system is relevant to all governance structures at any level of scale, whether a nation, a company, a school, a city, a foundation, the world, or a single community. Indeed, yoking independent learning experiments is very much what a community of practice achieves when it connects disparate practitioners with their own independent work into a learning system where they learn from each other.

To make sense of the governance role of "keeper" of the learning system, it is useful to distinguish between two forms of governance:[32]

- *Emergent governance*. Learning governance bubbles up from a distributed system of interactions.
- *Stewarding governance*. Learning governance derives from a concerted effort to act as the keeper of a process.

In the examples above, venture capitalists provide an emergent form of learning governance when they distribute risk at a societal level.[33] By contrast, the federal government's role in providing resources to convene a cross-city community is of stewarding governance. Which form of governance or some hybrid is appropriate for what issue or situation is a delicate design decision for learning systems—and so is what kind of social structure is appropriate: government, NGO, philanthropy, community.

There is an array of governance-related questions. What are governance principles for maximizing learning capability? How does a governance structure negotiate with the system what learning means, what knowledge means, and what capability means? What are the roles of elections and stock markets? Are the politics of learning fundamentally different from the politics of knowing? From this light, how to reinterpret the role of governance-oriented organizations such as government bureaucracies, legislatures, courts, NGO's, unions, foundations, etc.? How do these new roles complement or conflict with more traditional governance roles, such as policy-making, oversight, assessment, and adjudication? Do these new roles entail a horizontalization of decision-making processes? What are the effects of these new roles on the identities of the governed? Do they change the meaning of citizenship? How does this kind of governance invite new kinds of trajectories of participation?

[32] This is parallel to the distinction by Jane Jacobs (1993) between two "modes of survival": the commercial mode and the guardian mode. She is interested in the moral foundations of these two modes, which she argues are fundamentally different. One could also interpret them as learning functions. One uses the distributed, emergent processes of the marketplace to make decisions, and the other uses the concerted process of stewardship.

[33] They may, however, take on stewardship governance with their "clients" or by organizing their own community of practice as some Silicon Valley venture capitalists do (see Leonard and Swap, 2000).

Education: the management of trajectories of identity

If trends such as the ones of Section 2 are confirmed and the world they sketch out is what students are to face, we will have to shift from an industrial model of education as the *mass production of skills* toward a knowledge-era model of education as the *customized production of individualized learning trajectories*. This is not a naïve call for self-directed learning, for "free" schools, or for learning services selected in a self-service mode. This shift requires an ongoing reflection on the nature of coherent learning trajectories and on what it means to manage these trajectories intentionally. It also involves a reflection on the role of educational institutions, not as self-contained places of learning, but as integral parts of large-scale learning systems. I will now explore some implications of this shift, again with the caveat that this is quite speculative at this point.

First, the common obsessive focus on curricular content and test scores regardless of meaningfulness discourages many students from becoming personally engaged in learning.[34] This is often true whether or not they are successful in fulfilling the school's performance expectations. In many cases, the only way to succeed is to detach oneself from any passionate engagement with the material because investment in any topic becomes a time liability for covering the rest of the curriculum. This could be quite harmful in light of the trend of personalization that emphasizes the importance of meaningful engagement for productive participation in value creation.

Trends would suggest that finding a universal curriculum beyond a few basic skills of literacy is going to become increasingly difficult and less and less useful. The main reasons for this hypothesis have already been mentioned:

- the destabilization of cultural canons, which make curricular decisions arbitrary and indeed divisive
- the increased access to information and peripherality, which allows students to find sources of content other than educational institutions
- the individualization of trajectories of identity, which focuses students on specific goals
- the receding of common ground as the main source of social cohesion in favor of boundary crossing
- the shorter half-life of knowledge, which makes it less likely that what a student learns in school beyond the very early years of "basics" remains relevant later in life.

If curriculum coverage in terms of universal content is losing its validity as an educational benchmark, how can we talk about the quality of education? What kinds of experience are more likely to launch students on a sustained learning trajectory than the extent of curricular content? Can the focus on identity transformation in social learning systems help reframe the very notion of a curriculum? Developing a full framework to talk about education in these terms is one of the goals of the project, which I believe has the

[34] What meaningfulness means depends on a theory of the learning. A focus on identity places meaningfulness in a broad context of participation in social systems. For instance, it would not be enough to make learning math fun, to the extent that this assumes that learners are fun-seekers. We know that adolescents pierce their tongue and their belly button. When something is meaningful and in the service of their identity, they are ready to do things that are not fun at all. Similarly it would not be enough to make math meaningful with manipulatives because this assumes that the scope of meaning-seeking is restricted to the context of the lesson.

potential to transform how we conceive of educational design. Such an ambitious goal will require much research before a robust framework is established. But the dimensions of identity listed in the theory section already allow me to provide a sneak preview of what an identity-oriented "curriculum of meaningfulness" might look like. Such a curriculum would be framed in terms of a language about learning as identity transformation, for instance:

- *Experience of localized depth*. Going deep into some learning, into the practice of a specific community and get a good sense of what full membership is. Experience learning with others in the context of a community. Get far enough to experience peer-to-peer learning with masters of the practice.
- *Experience of boundary crossing*. Interaction across a boundary through engagement in a shared task that forces cross-boundary negotiation.
- *Experience of time depth*. Reach an experience of "flow" by being fully present and creative in an activity.
- *Experience of time dislocation*. Engage in a substantial contact with a different generation as a vista onto history or onto the future.
- *Experience of cultural dislocation*. Immersion in a different culture with a different discourse of the self.
- *Experience of agency and power*. Make a personal difference somewhere; not necessarily a great success in abstract terms; have an effect on the world that is experienced as personally significant.
- *Experience of scale*. This may be the most difficult to imagine and to achieve in practice. Hence its place last. Gain an appreciation of a full learning system in which one is personally involved by traversing the fractal at multiple levels of scale. Learn to find the community structure. Understand in as direct a way as possible how the levels constitute each other and how the various functions are effective across these levels (performance, governance, institutionalization, social fabric, personal trajectories).

The hypothesis underlying this list is that it is more important to enable transformative experiences of identity through full engagement with a few things that to cover extensive content. As a result, it need not really matter what the domain is for any of these experiences as long as it is meaningful to the student (and not harmful). But I would suspect one needs at least one serious, transformative experience of each kind to be a full participant in the 21st century.

Meaningfulness is really paramount here because of its potential for initiating a sustained learning trajectory beyond the educational experience. Given the importance of meaningfulness, it should be the criterion that determines when in the life of students each of the experiences listed takes place and in what order. Because life is the best source of context for an experience of meaningfulness, timing is critical. The foregoing suggests that it makes less sense today to "frontload" education into the early years of life. The time is long gone anyway when we could think of the first decades of life as learning in preparation for the rest of life, which is mere "application."

What is required is lifelong, but intermittent trajectory management. One could therefore imagine a system where schooling is a lifelong, but intermittent experience. It is always available as a place to take a breath, reflect, redirect one's trajectory, gain some new

experience not available in the rest of one's life. But it does not hold you beyond its ability to provide you with a meaningful experience. It mixes students of all ages. Again this is not a self-service offering of courses, of which the student is an occasional customer. It is much deeper. It is really a place of trajectory management with a focus on identity and meaningfulness and the resources to do this well at any age and with longitudinal coherence. Education thus construed is not preparation for something else, but a rhythm of moments of focus on identity renewal that are integral to a full life trajectory.[35]

Far from arguing for the death of school, this perspective makes school a very special place indeed.[36] Its special role in life trajectories requires a distinct institution, free from some of the pressures of society, yet it cannot fulfill its function if it remains sequestered from the world. It needs to abandon the traditional view of educational institutions as *the* place of learning in society and take society as the place of learning.

One reason curriculum has become so salient is that our schools act a bit like what Erving Goffman calls "total institutions." By this, he meant institutions that attempt to become the entire life-world of their inhabitants through a kind of "civil death." Of course, he was studying much more drastic institutions, such as prisons and mental hospitals. Most schools do not fit this category in the lives of students. But they do tend to act that way with regard to learning. They fix the curriculum, control the learning process, and test you on it in its terms. Forget your broader identity. It does entail a kind of "civil death."

The sequestration of educational institutions from the rest of society was once very important to protect children from rapacious child labor, and remains so in a number of countries. But it makes less sense in many societies today if we consider the price of the separation: that education has to forego using participation in learning systems outside as primary curricular material. Indeed, the focus on individual identity requires a parallel expansion of the context beyond single institutions to the large-scale learning systems that provide the learning material for a trajectory: identity stretches across the social fractal.[37] School becomes really special if it is thus integrated in the broader learning systems.

- *For students*, it means using the school as an anchor for constructing a coherent trajectory in the world, i.e., learning to participate meaningfully in the world around them as key to their ability to be lifelong learners.
- *For practicing practitioners*, it means that their own learning systems are part of the educational system. Their lives, their passions, their identities, their aspirations, their knowledge are the curriculum. Perhaps practitioners eventually become the main content resource. (And they are students too, anyway.)
- *For schools*, it means mediating between learners and learning systems in the world and acting as a source of coherence for real trajectories of participation.

[35] Note that this would immediately solve the "school drop-out" problem by eliminating it altogether. School is not something you can drop out of, but something you are in and out of constantly through your life. This is not as tongue-in-cheek as it sounds. Maybe we have created the drop-out syndrome by artificially frontloading schooling in life.

[36] I say this because some people did interpret the early work on legitimate peripheral participation (Lave and Wenger, 1991) as an argument against schooling.

[37] This is why even today, the illusion that school is the enclosed source of learning is not sustainable.

- *For professional teachers*, it means focusing primarily on trajectory management—understanding student in terms of coherence of trajectory, being aware of available resources, having good networks to connect students. A very important and difficult job. Only secondarily are they delivery vehicles for specialized curricular material when needed. And last but not least, they are adults in their own right with their own lives, passions, and identities, which become resources they can invite students into. And they are students themselves, as everyone, intermittently. All the teachers who really had an effect on me were teachers who invited me into their own passion and identity. Sometimes inside the classroom and sometimes outside, but always as adults living in the world, not as roles in the institution. Personal passion for a domain, curiously, is currently not a requirement for teaching.

Whatever their value as speculation, these images do bring to the fore important questions about the place of schooling in a learning society. How can education be an integral part of broader learning systems? If we accept that much time should be left open for personally meaningful experiences, what is the strict minimum that all students should cover initially, such as knowing how to read? How to make sure that this core remains minimum while evolving to reflect the times? What becomes of the certification role of schooling? What are the indicators that an experience is productively transformative and that a school is really acting as the special place it is meant to be?

Theory in practice

These institutional musings may be completely misguided. The project may shoot them down one by one on the basis of systematic research. But they do illustrate the kind of long-term, theory-driven conclusions I would like to be able to reach. So I have not held back even though I am reluctant to be specific too early.

No matter how it evolves, this learning-systems vision needs to become cross-sectoral. The project will seek patterns across institutions. What one can learn from the others? What design principles cut across sectors? How does a principle such as the yoking of learning or the distribution of risks, if relevant, apply in business, in education, or in civil society? What does the choice between emergence and stewardship look like in these different contexts? And how do these institutions play complementary roles in the overall learning system? How does the opening of the school affect civil society? How do the designs for business organizations interact with the designs for school? What does this say about the role of government in the process?

Again, it is worth repeating that the purpose of the project is to open up possibilities, reveal patterns, and feed the imagination; not propose specific designs. This is because in the realm of social theory, the role of theory can only be to propose conceptual perspectives that train the eye to see. Theory is not to be implemented; only adopted as a tool. Final say has to be left to practitioners in the field who can see the terrain. May theory gives them good eyes to see; and may their seeing eyes rescue them from theory.

4. Learning stories: a corpus of cases

Last but not least, this enterprise needs an empirical basis. This empirical part of the project consists in looking for early examples of situations that can be usefully seen through the lenses provided by the combination of theory, trends, and implications—a community of practice, a company, a change in attitude, a development project, a

product, a policy, a regional agency, a fad, an experimental school. In short, where can we find early cases that, as a straight story or under reinterpretation, give life to the framework?

- *Theory*: How do the dimensions and distinctions of the theory illuminate a situation?
- *Trends*: Where do we see early indicators of a trend or counter-trend?
- *Implications*: What projects or designs embody, even in incipient ways, principles that reflect the framework?

Most stories are likely to involve a combination of the above. Some stories may also provide counter-examples that challenge or put into question one or more of these elements.

Purpose of the corpus

Through a systematic collection of stories—so-called "systematic anecdotal evidence"—the ambition is to combine the situated richness of narrative with the ability to perceive broad patterns. A systematic collection of stories and cases interpreted from the perspective of the theory should make it possible to see patterns and extract principles in ways that traditional quantitative studies could not and in ways that would not be possible from the inside of any particular story.[38] Concrete stories illustrate elements of the framework and contribute to its development.

- *Theory*: They make the theory concrete, test its usefulness, probe its limits, and suggest refinements.
- *Trends*: They provide evidence for (or against) the trends, show the complex and various ways they manifest and perhaps reveal deeper patterns.
- *Implications*: They provide concrete examples of what is possible in practice, inspiring others to try their own version and warning them of potential pitfalls; they also test the theory in practice through an evaluation of its implications for action.

Theory is the backbone of this process because it provides the discourse to interpret a variety of situations in comparable ways and extract principles applicable beyond the situations under study. The goal is to build a broad picture one story at a time, a bit like an expressionist painting, but with an anchor in theory as well as hypothesized trends and implications.

Elements of the corpus

The exact composition of the corpus is likely to evolve. It will eventually be possible to include some quantitative data in the corpus, but the initial thrust is toward qualitative research to explore the key categories and concepts that define the topic. Here are some elements I am considering:

- *Database of existing resources.* There is already quite a bit of material that could be catalogued in one bibliographic database, including newspaper stories and magazine articles, academic papers, multimedia documents, community reports, etc. Some of these may need reinterpretation to fit in the framework.
- *Open registry.* I have had a dream for a while of establishing a registry that will enable anyone anywhere to register their community of practice, learning system, or

[38] I am hoping to benefit from the experience of other projects that have attempted to build databases of stories, such as the work of David Snowden (2003) at IBM and of Bronwyn Stuckey (2004) at Wollongong University.

personal learning story via a web-based form that would act as a guided narrative. This would allow a great many people to participate in the research by contributing their story.

- *Detailed case studies.* Build a series of in-depth case studies, using ethnographic methods, such as direct participant/observation and interviews. Examples of topics may include actual communities of practice and community-based initiatives in different sectors (we can still use good examples of these), applications of a communities-of-practice approach to unexpected problems, innovative projects, analyses of boundary processes and large-scale learning systems. I would also like to include individual learning biographies highlighting key events that shaped a learning trajectory.

The inclusion of detailed ethnographic studies is an essential element of this project. One of the dangers in hypothesizing trends, patterns or design principles is to let them take on explanatory power. For instance, one could fall in the trap of assuming that the horizontalization trend is making people act in a certain way. An ethnographic study accounts for the details of agency in context—from the situated perspective of participants—without assuming that any trend, pattern, or principle under study is causally effective in the situation (except to the extent that these are actually known to social actors and used in the negotiation of what they do).[39] In other words, the situated discipline of ethnographic studies helps ensure that patterns in the conceptual framework do not become self-confirming.

A nexus of research projects

This is not a project for one person. This research agenda is meant to spawn a multiplicity of research projects that contribute various facets to the overall picture. It will take a diversity of perspectives, across disciplines within the academic world, and among reflective practitioners, who can contribute their own stories and insights as well as benefit from the conceptual tools the project intends to produce.[40]

In a university context, this research agenda offers many opportunities for students to become involved:

- Collect, reinterpret, categorize, and analyze resources and stories.
- Look for patterns in the resource database and the story registry.
- Produce ethnographic case studies or biographies.
- Study a trend or an implication.

The overall research agenda will create a framework for dissertations in fields including the social sciences, education, business, and government studies. Student participation can take place at various level of involvement. Undergraduates and masters students may focus on one illustrative case. Doctoral students may hypothesize a trend or a major implication and collect evidence to support or dismiss their hypothesis.

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[39] This is an important criticism leveled at some structuralist and functionalist theories (Willis, 1977; Giddens, 1984).

[40] Foundations for such a cross-sectoral, cross-disciplinary community already exist. The members of CPsquare, a community of practice on communities of practice I co-founded, constitute an initial kernel that is already engaged in cross-sectoral explorations and hungry for research projects (see www.cpsquare.org).

I also expect to partner with foundations and organizations interested in specific aspects or application areas of the proposed work. Again this would provide opportunities for students to become involved in projects. Examples of good candidates would be corporations or associations working on their internal and external learning systems, or foundations interested in the future of education, the formation of leaders for the knowledge economy, practice-oriented reforms of continuing education in the health sector, new approaches to development projects as learning partnerships, community-based convening of government-sponsored large-scale learning systems on topics such as bioterrorism, regional development, or disaster preparedness, etc.

As a way to get started, I imagine setting up a course that covers the main elements of the evolving framework of theory, trends, and implications. As a course project, students are asked to explore a case they could contribute to the corpus. Some of these students become so involved that they pursue their investigation (with the same case or another) in the context of their own course of study—a senior project, a master's thesis, or a PhD dissertation. A number of them get interested enough to join the core project team, helping to manage the development of the corpus. Over time, the team serves as the coordinating kernel of a broader community of partners, which involves researchers, practitioners, and foundations doing related work in business, education, government, and other relevant fields. Focused workshops, conferences, as well as applied projects bring students and partners together. And year after year, the course reflects the work of this entire community, with direct participation of some members as guest contributors.

5. Learning in the future: reflection on methodology

Underlying this agenda is a research methodology that is itself in need of articulation and refinement. It is therefore useful to make such methodological reflection an explicit part of the project. In summary, the methodology works at three levels:

- At the *conceptual* level (theory) it attempts to find the timeless
- At the *pattern* level (trends and implications), it attempts to understand and enable the future
- At the *observable* level (stories and case studies), it attempts to look for evidence in the present (and possibly in the past)

The methodology has roots in qualitative methods, in particular ethnographic approaches, but it also has elements of action research[41] in its focus on implications, appreciative inquiry[42] in its attempt to see the future in the present, and scenario planning[43] in its aspiration to provide a long-term context for thinking imaginatively about possibilities.

- *Future-enabling*. The research is explicitly geared to the future. It seeks to see early indicators of possible futures by reinterpreting observable cases in terms of their foreshadowing something that the theory makes visible in the present.
- *Action-enabling*. One criterion for the validity of the research enterprise is that it be useful to practitioners in reframing their situation and opening new possibilities for action. But these studies do not necessarily entail direct intervention into the system

[41] See Argyris et al. (1987)

[42] See Cooperrider and Avital, eds. (2004)

[43] See Schwartz (1991)

under study. The primary purpose is to provide an interpretation of the emergent that can both reveal and enable change. In this sense, the enterprise is slightly different from traditional action research. The approach does not preclude intervention, but its principal aim is reinterpretation.

A number of questions call for ongoing methodological reflexivity:

- How much *historical, political, and socio-cultural* context is going to be necessary to analyze patterns and specific cases?
- Does the *ethnographic and narrative approach* scale up and down enough in time and space to be used to study both large-scale learning systems and individual identities?
- What constitutes the *conceptual rigor* of such a research enterprise? How to keep the centrality of the conceptual framework from biasing or homogenizing the overall enterprise? Are there systematic ways to select examples and counter-examples to make the overall picture more reliable?
- What constitutes the *application rigor* of such a research enterprise? How does the overall system of conceptual framework, trends, and implications with a corpus of case studies aggregate into a useful window on the future? How to make it all relevant and usable by practitioners and theoreticians alike? How to expose it to use?
- How to "*walk the talk*" both in building the project and in putting its results to use? The project is itself a learning journey that requires a community, and perhaps more than one. What kind of network will it take to create the necessary learning system to bring this project to fruition?

Through it all, it is necessary to combine theory and practice. It is essential to anchor policy-making, business transformation, school reform, civic development, philanthropy and other efforts in a theory of learning capability. But theory needs to stay close to practice, as it is its best source of inspiration and of safeguard from ideological delusion.

A learning theory for a small planet

Whether we embrace or actively resist so-called globalization, whether we care to understand large-scale systems or are satisfied to go about our daily lives—we do so in a context of growing awareness of the rest of the world. It is in our face on the news, on the goods we buy, on the www's we type. This is not just for those on the wealthy side of the digital divide. In some of the poorest villages on earth, one of the first things inhabitants acquire when resources permit, before running water, is a television with a satellite dish.

A useful learning theory today has to be a learning theory for a small planet. As the planet shrinks, our identities inflate, not in the sense of becoming bigger, but in the sense of finding material of participation and non-participation both locally and globally. The theory must be able to conceptualize learning in such terms. This is a tall order, but again the goal of the present project is to develop a discourse on learning, not to remake the world. The task of actually increasing the learning capability of our societies is the doing of a much broader social movement, which I believe is already at work. Given the

scope and subtlety of what needs to get done, producing a conceptual framework is an urgent, even if minute contribution.

It is increasingly important to be able to think about the world as a fractal social learning system, with nested levels of structure. Developing identities of citizenship at multiple levels of community is becoming a learning imperative, because the learning capability of all these levels eventually rest in our identities—these learned experiences of agency that serve as the social garments of our beings. Identification is our prerogative; we make ourselves as we invest it selectively in negotiating meaning. We can use it to open and to close, to engage and to withdraw, to stretch and to rest. We can use it to delineate ourselves and to invite each other. In our identities, we are free to be as small and as big as we care to be, because living in our bodies, we exist in our identities; we are in the last analysis, beings of meaning.

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I am excited by the prospect of pushing this research agenda forward. I am personally ready to roll; and I know there is a broad community of others who are ready to become engaged in various ways. At this point, I am looking for an academic home for this project. I am also seeking sources of funding from foundations and organizations interested in becoming partners. Support is needed for student projects, the systematic management of the corpus of cases and stories, workshops and conferences, and writing for a variety of audiences. If you think your institution may be a good home for such a project or if you are interested in a funding partnership, let us talk.

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