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# Learning Spaces for Innovation

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## ABSTRACT

Many institutions of higher education are creating learning spaces specifically designed to teach the innovation process through collaborative, multi-disciplinary and hands-on methods. In these spaces, learners are increasingly leveraging networked "learning ecologies" of ideas and people through both virtual and direct methods. In such networked environments, it is essential that individual learners self-direct their knowledge acquisition and take personal responsibility to innovate their learning experiences.

## Introduction

We often ask how we innovate, but less often how we create innovators. It is no stretch to argue that the goal of education is to produce people capable of accessing knowledge, developing valuable ideas, and turning these ideas into value-adding innovations. The quality of the experiences in learning space--physical spaces such as classrooms and labs, and virtual spaces provided by computers and the growing virtual infrastructure--is a critical component of enhancing the ability of learners to acquire knowledge and to develop the skills required to be effective innovators.

Today, cutting-edge learning spaces have both virtual as well as physical architectures. Information and communication technologies (ICTs) are creating diverse communities of practice both inside and outside the academy where ideas and knowledge are being created and widely distributed. Learning is becoming less a practice where students memorize and regurgitate stocks of knowledge and more a process where they leverage information and each other to collaboratively create new knowledge flows in complex and evolving learning ecologies.

In addition, the world outside the academy is changing fast, with the production of information quickly outpacing the effective processing ability of both individuals and organizations. In this dynamic environment, learners will benefit from acquiring a specialized set of "habits of mind and skills," including (among others): 1) collaboration, the ability to work in and organize multidimensional, multicultural project teams, 2) synthesis, the ability to create unexpected combinations of people and ideas to produce value-adding innovations, and 3) explanation, the ability to identify and bring key ideas together to make the complex simple (Norris et al. 2008).

Norris et al. (2008) point to the need for individual learners to accept greater responsibility for building these capacities, noting that they will be even more important "in the face of the continuing revolution in knowledge creation, sharing, and utilization." They state that "individuals will need to demonstrate their capabilities to *perpetually* incorporate and interpret new knowledge by participating effectively in highly diverse, extended, and transnational teams and knowledge networks" (ibid., emphasis added). In essence, they argue for the importance of autonomous, self-directed learners who are motivated to engage continually with others in the process of learning and innovation. In short, learning is both an individual and a group effort, and it is on ongoing process.

## Innovation and Circles of Exchange

> Innovation is fostered by information gathered from new connections; from insights gained by journeys into other disciplines or places; from active, collegial networks and fluid, open boundaries. Innovation arises from ongoing circles of exchange, where information is not just accumulated or stored, but created. Knowledge is generated anew from connections that weren't there before.
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> —Margaret J. Wheatley (1992)

Throughout history, the innovation process has involved people responding to ever-changing system conditions and adapting human activities in the search for balance, growth, health, and profit. These changes--in economic, environmental, and social system--range from the gradual and predictable to the rapid and unpredictable. Societies and civilizations that do not anticipate or that adapt to change slowly and reactively have typically not fared well. Indeed, transitioning to a more robust, stable, and resilient system conditions requires people who are able to not just react to change, but who can identify the signals of change and proactively anticipate the risks, needs, and opportunities that such change brings.

The role of innovators and innovations is important for anticipating and identifying the opportunity spaces created by change, and in facilitating smoother, less disruptive transitions. These opportunity spaces can be considered as the inverse of the needs created by change. For example, as times and economies change, so do customer needs, tastes, and preferences, which presents an opportunity to create new ways to address those needs. Environmental change, or changes in the availability of resources, often creates the need for cleaner technologies and/or new resources. Some of these needs are clear and present, but others are latent or not ripe, and point to the importance of anticipating and preparing in advance.

For Margaret Wheatley (1999), the innovation process is furthered by "circles of exchange" among co-learners that provide for the continual generation of new connections to ideas, disciplines, and people. These new connections foster a greater diversity of ideas and insight and bring the power of more minds to anticipating change, developing knowledge and ideas, and creating adaptive and innovative solutions to new and emerging problems (a greater "foresight-fit" capacity). Using an ecosystem analogy, this process is similar to looking for the idea or innovation that best fits the niches created by change. Networks connect learners in the development of ideas, and innovations facilitate the process of variation and selection (e.g., through prototyping) in the search for the best fit--or, put simply, the search for what works best given new system conditions.

Looking at innovation from this broader perspective, campus innovation labs can be seen as physical spaces able to connect to interdependent, networked learning ecologies in order to speed up the cycle of learning and innovation (i.e., the process of identifying what works). In networked learning ecologies, it is incumbent on each learner to create their own ecosystem of nested relationships where circles of exchange can take place. In this sense, an entire campus can be a network, and each student within that network can have their own networks that extend beyond the campus boundaries. It is possible in this way to grow increasingly complex, networked learning communities, where each individual has access to information that they, interpret, remix, and share with others. Such agile learning networks should be able "to identify weak signals faster, come up with solutions faster, and adapt to change faster" (Miemis 2010)—in other words, they should foster faster innovation and more effective, smooth, and perhaps profitable transitions.

## The Role of the Learner/Innovator

> In today's world, where everyone is so interconnected and interdependent . . . if we are going to solve the biggest, thorniest and most widespread problems in business and society, we have to innovate in ways that truly matter. And we have to do all this by taking personal responsibility for all our relationships—with clients, colleagues, partners, investors and the public at large.
>
> --Samuel Palmisano, IBM Chairman, President, and CEO[1]

In "The Evolving Social Organization," Harold Jarche and Thierry deBaillon (2010) note that "being open to self-education is the foundation of individual learning," and that "sharing is an act of learning and can be considered an individual's responsibility for the greater social learning contract. Without sharing, there is no social learning." The key point is that we can't have social learning without individual learning. Collaboration and networking are important, but the collaborators and networkers must join the intellectual fray as individuals who have successfully created their own personal learning environments and who are able to construct their own ideas and knowledge that they can then share with others.

The value of sharing knowledge, of "taking personal responsibility for all our relationships," is straightforward: no one knows everything, and everyone knows something. Simply put, there is more knowledge in the network than in the network's individual members. Sharing in such an "open-innovation" framework helps to avoid the inefficiencies of reinventing the wheel while leveraging a larger collective brain to (hopefully) accelerate the innovation process.

The responsibility of each learner to share information and knowledge in the social learning contract also requires trust and reciprocity (Teigland n.d.). A group of individuals sharing with each other what they know produces the "positive spiral" that is a key value of social networks: 1) an individual contributes, 2) others in the network reciprocate, 3) information and knowledge is winnowed, sifted, and accumulated, and 4) value is added. The cycle is ongoing, but without an individual's contribution and trust that others will reciprocate in kind, the cycle breaks down.



1 http://www.slideshare.net/eteigland/energizing-change-through-network-leadership-presentation.

Such an open-innovation framework is well suited to the current generation of learners, as they are familiar with computers and tend to think and operate in networks (often in the form of social networks such as Facebook). Further, as Kellner notes:

The cultural terrain of cyberspace produces new sites of information, education, and culture, as well as novel on-line forms of interaction between students and teacher. In addition, possibilities of students developing their own spaces, cultural forms, and modes of interaction and communication should be promoted. Indeed, the new technologies and cultural spaces require us to rethink education in its entirety, ranging from the role of the teacher, teacher/student relations, classroom instruction, grading and testing, the value and limitations of books, multimedia, and other teaching material, and the goals of education itself (n.d.).

What is the role of the teacher and learner, and what are the goals of education, in this world of new technologies and cultural spaces? Peter Senge (2000) suggests that educational institutions today "need to move from being institutions of learning to learning institutions" capable of evolving in response to the learning needs of students, and of extending the learning process beyond the physical learning spaces and coursework. In this learning organization model, learners would be more directly involved with creating the conditions of their learning experiences; in terms of teaching and learning innovation, this suggests that learners, essentially, would take part in innovating how they learn to innovate.

In such a learner-directed environment, teachers would work with students as co-learners to define learning goals and outcomes and develop plans for acquiring the desired knowledge and competencies, whether in the practice of innovation or in any academic discipline. Teachers (co-learners) would be less the "sage on the stage" than a supervisor or facilitator. The learning process itself would become one of the "real world" problems to be explored by teachers and learners in a co-learning exercise. As Christopher Dede writes: "If learning is primary to teaching, students are not customers of the product that teachers sell. They are co-creators of the learning process" (2007). That is, if students are in part responsible for their learning, they should be allowed to play a role in innovating the very institutions in which they are learning. And, as Dede notes, they may already be "playing a big part in that reinvention. It is just that our hierarchical lens prevents most of us in universities from seeing that part" (ibid.).

## Conclusions

Physical learning spaces serve as the hub of a wheel of physical, virtual and networked, and cognitive learning spaces. For space planning, this suggests highly malleable spaces that users can interact with almost like a living thing--co-creating as necessary the systems/networks/platforms they use. In this organic conception, planners of learning spaces (broadly construed) would have a range factors to consider, including (among many others):

- the growing understanding of how people learn (how the brain works, what environments and pedagogies are best for each individual);
- the growing understanding of how people are *motivated* to learn: what inspires people to take control over their learning;
- the needs of citizens as learners in a "learning-intensive society," and to know how to self-direct their learning and the acquisition and utilization of knowledge;
- the opening up (greater transparency) of information sources (open source, open educational resources) and the potential therein for collaborative, networked generation of knowledge flows;
- the opportunity to create customized learning experiences; and
- the need to anticipate and accommodate ongoing technological and pedagogic change.

A thoughtfully designed physical space situates the learning process and nourishes connections among ideas and people. We know much more about how people learn than in the past, but little of this research has been translated effectively into the design of spaces for learning. We do know that good learning spaces enhance learners' capacities for critical thinking and reflection, allow for collaborative discovery, and offer many ways for learners to interact and communicate. Learning, like innovation, is often a messy, nonlinear, unpredictable process that involves both individual and collaborative effort. If done well, the learning process can excite and engage a learner's natural curiosity and provide the motivation for self-direction and attainment of subject mastery. The challenge for designers of tomorrow's learning spaces is to create spaces that allow learners to be co-creators of the learning process, and that foster innovation within students even as they provide a space for learning the process of innovation.

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