# HOW CAN INNOVATIVE LEARNING ENVIRONMENTS PROMOTE THE DIFFUSION OF INNOVATION?

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## Abstract

*Schools implementing innovative learning environments (ILEs) face many challenges, including the need to discard previously cherished practices and behaviours, adjust mindsets, and invent successful new ways of operating. Leaders can support these processes by implementing structures that: i) support ongoing, distributed, participatory innovation; and ii) promote the widespread diffusion of these innovations. This article will argue that innovative learning environments provide unique opportunities to accelerate the generation and diffusion of innovation, particularly through high levels of observability and trialability of ideas; effective communication channels; and supportive social systems. In short, successful open, collaborative learning environments require serial innovation and rapid diffusion of innovation, but they also provide the conditions to support both of these processes.*

## Keywords

Change leadership; innovation; knowledge building

## Introduction

In his book *Leading Change*, John Kotter (1996) describes the different kinds of decision-making structures required for organisations operating in slow-moving worlds and fast-moving worlds. He argues that a networked structure, as opposed to a pyramid-style organisational structure, enables an organisation to cope more effectively with the continuous, on-going change that accompanies the modern world. His argument holds that the traditional 'lone ranger' boss who processes information and communicates decisions in a sequential and orderly fashion can't keep up with rapid changes in context, because rarely in these situations does any one person have all the information needed, or the time and credibility to convince lots of people to implement these decisions. Kotter (1996) also makes the observation that organisations experiencing times of considerable change need to rapidly innovate and equally rapidly diffuse these innovations throughout their organisations in order to successfully respond to the speed of these changes. This article will outline the case that i) serial innovation is essential when transitioning to innovative learning environments, but also that ii) innovative learning environments can, in turn, accelerate the wide-spread adoption of these innovations. Throughout, reference will be made to Everett Rogers' (2010) theories of the diffusion of innovation, and in particular, the notion that the rate of change in adoption of innovation often follows a sigmoid-curve (see Cowie & Hipkins, this edition)

## Innovation in Innovative Learning Environments

Many schools and kura (Māori immersion schools) in New Zealand are exploring innovative learning environments (ILEs). These spaces are different from the traditional 'assembly-line' architecture that was common during the height of the industrial age of education. For most schools and kura, this move represents a significant new paradigm. Many of the practices that worked very well in a traditional 'one teacher, one classroom, one class' approach need to be revisited and (in many cases) discarded or replaced. For instance, how does one plan a lesson or learning sequence when there will be more than one educator involved in its delivery? Or, how does pastoral care look when there are 90 learners and three educators in a learning environment? In order to learn to operate successfully in these new learning environments, educators need to *innovate*: "to move beyond existing routines,

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rethink key ideas, and question assumptions and values," (Hammerness, 2005 cited in Blackmore, Bateman, Cloonan, et al., 2011, p. 47).

These kinds of deep changes to practice are what Waters, Marzano, & McNulty (2003, p. 7) refer to as 'second-order' changes, or those which require people to abandon previously valued behaviours and activities, make a break from the past and develop new knowledge and skills. By contrast, 'first-order' changes are those that are incremental in nature, less disruptive to the established order, and those which can be implemented using existing knowledge and skills. To give concrete examples, a first order change might be that a teacher seeks to accelerate reading progress by setting up peer feedback for students in addition to teacher feedback (an individual teacher, incrementally improving their effectiveness). A second-order change might be that the same teacher works collaboratively with another in order together offer a variety of needs-based workshops for learners (two teachers, making a step-change in practice to offer options not possible in a 'lone teacher' arrangement.)

## Fostering innovation

### *Building adaptive capacity*

Second-order change is also known as 'adaptive change' and an organisation's ability to successfully implement such changes is described by Heifetz, Grashow, and Linsky (2009) as its level of 'adaptive capacity'. More fully defined, adaptive capacity is "the capacity of systems to engage in problem-defining and problem-solving work in the midst of adaptive pressures and the resulting disequilibrium." (ibid, p. 12). Heifetz et al. list a set of five features shared by organisations with **high adaptive capacity:**

- *Elephants in the room are named:* 'undiscussables' are minimised so all members of an organisation are empowered to critique mindsets and practices; confront areas of complacency, and ask the questions that need to be asked.
- *Responsibility for the organisation is shared*: people look beyond their own immediate areas of responsibility to lend a hand or discretionary resources to advance the greater good.
- *Independent judgement is expected:* decisions made by people are the ones that only they can make; all others are delegated to team members to grow their decision-making capacity.
- *Leadership capacity is developed:* forming a pipeline of leadership talent in order to avoid potential bottlenecks formed by a lack of leadership potential.
- *Reflection and continuous learning are institutionalized:* difficult reflective questions are asked; smart risk-taking is rewarded, and experimentation and prototyping is honoured.

One principle these five elements have in common is 'participatory decision-making' or empowering individuals and teams to make their own decisions and take greater responsibility for finding and solving problems across the organisation. This affirmation of the need for teachers to be empowered to innovate aligns with other findings that suggest that, when designing innovative learning environments, engaging teachers in the design and implementation phases is critical to ensuring effective learning outcomes (Blackmore, Bateman, Loughlin, O'Mara, & Aranda, 2011). This kind of complex, participatory problem-solving, where solutions are generated and implemented by stakeholders themselves, rather than experts with 'answers', is also known as a type of *knowledge creation*.

### *Knowledge creation*

Knowledge creation, as Scardamalia and Bereiter (2006) see it, is distinct from simply learning about things. According to them, 'learning' is a process by which "people acquire the intellectual heritage of their community". So a teacher might learn which strategies are well-regarded when it comes to helping dyslexic students improve their writing, or which low-level interventions are best for dealing with challenging behaviour. Whereas, learning, in this context, is often about accessing existing knowledge, knowledge creation, is "a process by which new knowledge is created" (van Aalst, J., 2012, p. 221).

An example might be that a team of three educators attempt to design an approach to collaborative planning that works well for them and their learners. To address this challenge, the team must engage in genuine knowledge creation: they will certainly draw from the intellectual heritage of their community, but no one person has the perfect answer, and the challenge defies simple problem/solution thinking because it touches on a wide range of different factors, all of which contribute to the formulation of the challenge. The teams' response must consider curriculum and pedagogy, but also tracking and accountability, reporting to parents, the use of technology, the relative strengths of the different team members and so on. Team members will draw from existing knowledge (learn) but they will also have to combine this with new approaches uniquely suited to the challenge at hand (create new knowledge). Knowledge creation therefore, is synonymous with addressing adaptive challenges, and with supporting innovation, or the development of new ideas that have relative advantage over existing processes and practices (Borrego & Henderson, 2014).

In the same way that 'learning' is not enough to ensure a successful transition to an innovative learning environment, adopting a single innovation is not enough either. The work of researchers like Peter Senge (1990, p. 7) tell us that we need to see all elements of the system as a whole in order "to make the full patterns clearer, and to help us see how to change them effectively." Organisations that engage in systems thinking are places where people are "continually discovering how they create their reality and how they can change it," (Senge, 1990, p. 7) not through engaging in a sequence of discrete innovations, but by innovating across the system as a whole, ensuring that consideration is given to the effects of each change on other parts of the system.

### *Systems thinking*

In addition to the innovations needing to be system-wide, they also need to be ongoing. Blackmore, Bateman, Loughlin et al. (2011) explicitly identify the importance of what they call 'serial redesign' for ensuring innovative learning environments remain innovative. They argue that this kind of ongoing, participatory redesign is fundamental "in order to achieve sustainable impact within a rapidly changing context (p. 22). They also say that teachers who are not supported to innovate "may revert to 'default pedagogies' or 'the way we used to do things' rather than explore innovative pedagogies" (Thomson, 2009 cited in Blackmore, Bateman, Loughlin et al., 2011, p. 15).

Senge's view that multiple, ongoing, system-wide innovations are required to meet adaptive challenges is reinforced within the context of innovative learning environments by researchers such as Blackmore, Bateman, Cloonan, et al. (2011), who assert that:

i. Buildings alone are not enough; it is about relationships and changing cultures and practices.

ii. Ongoing (serial) redesign is vital in the process of designing, implementing, consolidating and renewing practice within innovative learning environments.

The implications of these two observations are that educators need to be developing and diffusing new practices (innovations) across all elements of the system, including relationships, cultures and practices, and these innovations need to be continually re-evaluated and renewed. The dynamics of these innovation processes fit the sigmoid-curve model of diffusion. As Cowie and Hipkins (this edition) remind us, multiple sigmoid (or s-) curves act to lift the 'carrying capacity' of a system while preventing regression to the previous status quo. Applied to the context of innovative learning environments, it is clear that educators learning to operate in these new spaces will need to engage in double (or multiple) sigmoid-curves of development/diffusion across a range of different contexts in order to ensure the transition to these new spaces is successful across the different elements of the system.

## The diffusion of innovation

The diffusion of these new ways of working often follows a sigmoid curve style-adoption: following initial prototyping or development by an individual or team, the innovation is adopted more widely across the organisation until it becomes part of the established repertoire of practice (Rogers, 1962). Specific examples might include developing consistent, school-wide approaches to behaviour management in collaborative learning environments; or the use of consistent models of planning,

implementing and evaluating co-teaching sequences; or particular technologies that support the kind of student-led learning the organisation is hoping to achieve.

Often an innovation will be developed or prototyped by an individual or small group before being more widely adopted by others across the organisation. However, as we have already seen, a single innovation will probably not lead to a successful response to an adaptive challenge; to meet adaptive challenges, multiple concurrent innovations will be required, and each of these innovations will need to be widely diffused in order to maximise the rate at which less effective practices are abandoned in favour of newer, more promising practices. Rogers (2010) identifies four factors that affect the rate of adoption of an innovation within an organisation: the innovation itself; communication channels; time; and the social system within which the innovation sits. Each of these is now considered in turn:

## *The innovation*

The first stage of the diffusion process is the innovation itself. Without this, clearly no diffusion can take place. Rogers (2010) suggests the following perceived attributes of innovations, each of which contributes to the overall rate of its adoption:

- relative advantage is the degree to which an innovation is perceived as better than the idea it supersedes;
- compatibility is the degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of potential adopters;
- trialability is the degree to which an innovation may be experimented with on a limited basis;
- observability is the degree to which the results of an innovation are visible to others; and
- complexity is the degree to which an innovation is perceived as difficult to understand and use.

Two areas where innovative learning environments provide an advantage over traditional single classrooms are observability and trialability. If an innovation is trialable, it is able to be experimented with. Processes such as teaching as inquiry, action research or design thinking offer opportunities for educators to experiment with and explore promising new practices. Innovative learning environments often provide spaces, resources, feedback and social support to assist with the trialling of innovations. Under the right conditions, ILEs can act as innovation incubators, generating new practices as well as helping to spread them through the social system.

The second key area is that of observability. Innovative learning environments often make teaching practice more observable to others through the use of design elements such as internal windows, open spaces, and sliding glass doors. However, educators can enhance these physical elements by making explicit to their colleagues the innovations they are trialling. Consider a teacher trialling a new approach to writing that involves grouping learners into mixed-level peer-feedback groups, based on their achievement in writing. Hidden behind closed doors and solid walls, this new approach might never move beyond that single classroom. In an open space, other teachers can watch and learn from what happens.

Opportunities to observe, understand, believe in, and trial an innovation all lead to an increase in the rate of the diffusion of that innovation. Open, collaborative learning environments can offer spaces where all of these processes can take place simultaneously. In fact, Bull and Gilbert in their 2012 exploration of schools supporting paradigm shift among teachers found that a key element in this process was “open plan teaching spaces where [teachers] could observe each other teach”. A specific example here might be that two teachers want to build the self-directed learning skills of their students and decide to use a style of co-teaching in order to do this. In a three-teacher collaborative learning environment, they plan and deliver a sequence that allows learners to move between one teacher who offers a series of targeted workshops and a second teacher who offers support with more independent activities. These two can prototype the innovation inside an environment that has appropriate furniture, space, connectedness and flexibility, but also with the advantage of having a third teacher in the space to lend a hand or to offer critique or feedback if necessary.

## Communication channels

In addition to the innovation itself, a second factor which influences the diffusion of innovation are the communication channels within the organisation. The open, connected nature of the design of many innovative learning environments means that they offer the potential to offer "greater communication and interdependence among teachers" (York-Barr, Ghere, & Sommerness, 2007 P.318).

These improved communication channels can support what is known as 'sense-making', or the process by which people "structure the unknown" (Waterman, 1990 cited in Weick, 1995). Consider a teacher making use of a range of different spaces within an innovative learning environment to better differentiate learning for their students. For the uninitiated, seeing groups of students scattered across a wide space might seem disorganised or slightly chaotic. But for a colleague who knows that this teacher is working on an innovative way to allow groups to report their findings back, the 'unknown' suddenly becomes structured. These enhanced communication channels assist with sense making but also with tightening the loop between a person first learning of an innovation, and the decision to either adopt or reject it. In this respect, the strong communication channels within an innovative learning environments are inextricably linked with the third element in the diffusion process: time.

## Time

In a traditional 'one teacher, one classroom, one class' arrangement, it might take weeks, months or even years for an innovation to spread through an organisation, partly because that innovation is locked away behind the walls and doors of the traditional classroom. Open, collaborative learning environments can radically decrease the amount of time between two crucial parts of the diffusion cycle: understanding and taking action. We can see these two elements in Karl Weick's definition of sense-making: "the act of turning circumstances into a situation that is comprehended explicitly in words and that serves as a springboard into action," (Weick, 2005, p.409) This notion that understanding serves as a springboard into action also aligns with Rogers' (2010) view of the process by which an innovation is adopted: knowledge, persuasion, decision, implementation and confirmation. What's crucial to note here is that enhanced communication channels provided by a collaborative innovative learning environment can decrease the amount of time between understanding and action, or increase the pitch of the sigmoid curve of adoption.

## A social system

Communication channels obviously sit within a wider social system, and this whole system is vital to the process of diffusing innovation. Perhaps the key shift that takes place when a school moves towards innovative learning environments is that teachers move from operating primarily as individuals to operating as part of a team. It is important to note that a social system is not simply the collaborative team within the learning environment, but a wider "set of interrelated units that are engaged in joint problem-solving to accomplish a common goal" (Rogers, 2010, p. 23).

Social systems, particularly those that exist within a shared space, provide professional learning benefits for both newly qualified and experienced educators. Positive benefits for teachers align with the process of diffusing innovation: "discussing their experiences in the classroom with colleagues, talking about their ideas about good education, and observing each other's lessons" which grows "self-confidence and enthusiasm of teachers to continue experimenting with new pedagogical approaches in their classrooms" (Zwart, 200, p. 167).

A cautionary word here though: group culture within these social systems holds tremendous power when it comes to determining whether an individual will adopt or reject an innovation. Researchers such as Cummings (2004) have found that "individuals are likely to resist organizational change that is not supported by group norms and expectations". The double implication for practice here is that organisations should always align innovations with the values and beliefs of their organisation and the social systems should be deliberately crafted to be open to, and ready for change, where it does align with values and beliefs.

The social system can also be an important support structure for participants as they move through personal challenges as part of the change process. Seedsman (2015) describes the challenge of ensuring smooth operation of the status quo while fostering innovations that will potentially help teams cope with emergent challenges: "The balance of operations and decision making are critical and contingent upon knowing when a new curve is needed, as well as having effective means for allowing new ideas and possibly new people to coexist with the old guard." The personal support, collective evaluation of practice and triangulation of multiple perspectives can serve as a useful support for people through this ambiguous phase of 'co-existence'.

## Conclusion

Schools embarking on implementing innovative learning environments face many challenges. These challenges will become adaptive if they cause individuals and teams to discard previously cherished practices and behaviours, shift mindsets and invent new ways of working. These challenges are best addressed by fostering serial, distributed, participatory innovation, as well as conditions that support the diffusion of these innovations. However, innovative learning environments provide unique opportunities to accelerate the generation and diffusion of innovation, particularly through high levels of observability and trialability of ideas; effective communication channels; and supportive social systems. In short, successful open, collaborative learning environments *require* serial innovation and rapid diffusion of innovation, but they also *provide* the conditions to support both of these things.

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