



## Tinkerers, learning organisations and sustainable innovation

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The contribution of the lone ranger educator who tinkers with applications, testing discarding and working haphazardly around systems, should be seriously considered. Whilst learning organisations want to be perceived as dynamic structures that recognise and support innovation in curriculum and teaching practice they cannot responsibly incorporate every technical change, new invention or application, and idea into their curriculum. Collaborative teams concerned with responsible sustainability, should not be subjecting their ideas to natural selection. Before ideas can be disseminated through collective teams, there needs to be a diffusion of originality, innovation and thought between members of teams, and this frequently stems from the very tinkerers whose willingness to take risks and fail with new technologies is often regarded as inefficient and contradictory to organisational development.

As learning organisations embed open source and community developed software, they are finding themselves enmeshed with systems that are never complete and always being changed as the Internet magnifies the opportunities for tinkerers to adapt applications. When learning organisations embrace the open source option instead of using proprietary licences, they too have an obligation to support and participate in the development. This development is often done within a community that exists without concerns for sustainability and responsibility but uses an adaptive process of natural selection. An important way in which they can respond to this obligation is to provide an environment where lone rangers tinkering in the developmental role of resources can function.

Keywords: sustainable innovation, tinkerers, organisational innovation, open source

### Introduction

In recent years, the management of innovation in technology based curriculum has been cited as best done through co-operative team work within organisations. However, within this structure, the contribution of the lone ranger educator who tinkers with applications, testing and rejecting and working haphazardly around systems, should not be discarded. Before ideas can be disseminated through collective teams, there needs to be a diffusion of originality, innovation and thought between members of teams, and this frequently stems from the very tinkerers whose willingness to take risks and fail with new technologies is often regarded as inefficient and contradictory to organisational development.

As a species, the lone rangers are not easily eradicated, sometimes despite considerable organisational efforts. Perhaps this is because they perform a very necessary function. They can be a bridge between responsible management of learning and all the irrational, haphazard, and unfocused technological

developments that become available. The tinkerer is someone who adapts, changes, improvises. Tinkerers do not necessarily design for a purpose but create what they can with what they have. The tinkerer's work may not appear to be original because the tools the tinkerer uses may be cloned from someone else's work. (Jacob, 1977). The lone ranger tinkering on their own is someone who can take the risks of failure, misdirection, and imperfect adaptation that responsible organisations cannot. They therefore have an important role in learning institutions that wish to be seen as innovative educators.

The very way that tinkerers work, can be dynamically opposite to how organisations, particularly scholastic organisations, function. The tinkerer's work is always in a process of evolution. Inherent in the tinkerer's work is the prospect of arbitration by attrition as well as the expectation that the creation may be changed, rearranged and only succeed when adapted to someone else's purposes. In the tinkerer's world, nothing is finished and many ideas are discarded after development or cloned into a purpose not intended by the developer. The risk of failure is high and not calculated against possible benefits as the tinkerer continually trials and evolves the creation. The tinkerer's work will always be imperfect so they must exist in an environment that can sustain disorder. Tinkerers will not easily mesh in an environment that demands validation, finalisation, and sustainability. However, within this chaos, some truly innovative ideas can emerge but it is rare for a person enjoying the isolation to be interested in diffusing their ideas.

## **Organisational innovation and the tinkerer**

Whilst learning organisations want to be perceived as dynamic structures that recognise and support innovation in curriculum and teaching practice they cannot responsibly incorporate every technical change, new invention or application, and new idea into their curriculum. Unlike the sustaining technologies which support and enhance research and administration within a university, instructional technologies are by nature disruptive (Anderson 1998). In 2007 and 2008, the discussion was whether Facebook should be used for education. By 2010, many institutions, after experimentation adapting it to educational purposes, may dispute the wisdom of even considering Facebook as an educational tool. Even a selective examination of "Share your Top 10 Tools for Learning "(2010) shows that in just a few years, some unlikely technologies have been unleashed and others that originally appeared to be essential practice fell into disfavour.

It is impossible to know which applications will become main stream, which will vanish, and which will be superseded which makes it very difficult to be both innovative and sustainable at an organisational level. Lefoe & Albury, (2002) argue for a collaborative approach to innovation, where innovative individuals work together for a common goal. They believe this model will sustain innovation within an organisation. Kunzman, ( 2003) also argues for a formal structure of innovation which fosters skills of collaboration. However, responsible organisations do not adapt untested innovations into practice. A team charged with developing organisational innovation, should not be testing, discarding and adapting every new idea but should be focused upon implementing viable options.

According to Rogers (2003), innovation is "an idea, practice, or object that is perceived as new by an individual or other unit of adoption". However, there are variances in what is perceived to be new so that what is new to a team may not be new to individuals. Before a collaborative model of innovation can develop, there must be a process of innovative diffusion within the team and this can often emanate from those lone rangers tinkering outside the group. Robinson (2009) suggests the way to deal with innovators is to embrace them as partners in designing projects and recruit and train them as peer educators but lone rangers are not interested in collaborative, systematic approaches. Long before organisations have incorporated changing technologies, the lone rangers, with a preference for taking risks in isolation, will be tinkering with something else, leaving others to disseminate their work. Software professor Edward Felten, believes that tinkering with technology is a necessary first step to innovation because very little works emphatically without tinkering (Tinkerer's champion, 2002). McWilliam & Dawson (2008) describe what they call first generation or Big C creativity of an individual and second generation or small 'c' creativity of collaborative and purposeful activity. The lone rangers tinkering outside established practices are the first generation big C creators.

The educational tinkerers are not concerned with sustainability. They are the 'techies' and the visionaries who see technology as fun and challenging, and use technology to achieve 'breakthrough' improvements in teaching and learning. They are risk takers, experimenters, and horizontally

networked, (Wilson & Stacey, 2003). They often operate at the edges of curriculum and IT policy and guidelines. Omari (2009) suggests that such a devolved uncontrolled environment can mean that managing enterprise-wide information technology applications and systems is a challenge for many organisations. But should lone rangers tinkering in a chaotic environment be managed or discouraged? The literature has many examples of very successful tinkerers within educational organisations. Tinkerers are often successful because they are prepared to persevere with disruptive technologies. (Lefoe & Albury, 2002)

These disruptive technologies often result in worse performances initially, but this is not sufficient reason to discard them. Disruptive technologies should be subject to “tinkering” until the problems are resolved or the technology is clearly unsustainable (Christensen, 2000). Jacob (1977) in his discussion of evolution argued the whole process of evolution was an exercise in tinkering. He believed that the tinkering process tested imperfect creations against the risks of natural selection. In evolutionary terms, he agreed that the tinkerer’s solution could look bizarre and the result was often far from perfect. However, he believed if what the tinkerer cobbled together was adaptable and functional, the species would survive regardless of aesthetics or faults.

What is the role of the tinkerer in education, if it is not to participate in collaborative innovation? As with genetic evolution, the test of the work of the lone ranger tinkering with new technologies and ideas is its survival. If the lack of perfection and planning causes a major malfunction or if someone else cannot adapt the idea then it does not survive. In educational terms, it will not diffuse through to members of collective innovation teams.

When organisations sponsor collaborative innovation, are they supporting early adopters rather than fostering innovation with all its risks of failure? Early adopters are opinion leaders, people who take up new ideas and promote them (Rogers, 2003). Early adopters work within teams. They sponsor the process, use it, enthuse over it, and promote it but generally work within the system itself. Early adopters take up what has been decided and embed it, using the resources made available to them. Omari, (2009) argues for a model which implements clear governance frameworks for all IT, coupled with an enterprise view of ownership, a service orientation and sustainability as one of the key drivers and this is a model which supports early adopters. To truly foster innovation, organisations need to incorporate responsible sustainability and support risk takers. They can do this by supporting experimental curriculum, accepting flexible use of LMSs and ensuring IT controls support responsible practice, not restrict experimentation.

## **Organisations, tinkerers and open source**

In the changing world of educational technology, organisations even though concerned with sustainability and responsibility, cannot ignore a world that transforms daily. Many of the most innovative and effective applications and technologies that learning organisations can use have not developed out of corporate and organised collaboration, but from communities of tinkerers, creating and changing open source applications and adapting ideas and technologies. As learning organisations embed open source and community developed software such as LMSs, information management systems and portfolio applications, they are finding themselves enmeshed with systems that are constantly being changed as the Internet magnifies the opportunities for tinkerers to adapt applications.

Pogrow (2006) suggests that to function in the current climate it will be necessary to develop a generation of tinkerers to invent new learning environments and tools that are more powerful. According to Meyer (2007) tinkerers are people who want to improve a technology for their own reasons, by their own criteria, and who see no way to profit from it. Under these conditions, they would rather share their technology than work alone. He argues that the role of the tinkerer is an important driver of the open source explosion which only develops as it does because of them.

Whilst organisations relied on proprietary licensed software tinkerers in organisations were just that, people who played with technology but did not impact because of the restrictions proprietary licences placed on usage. However, in an open source world, tinkerers can become major contributors. By making enough contributions, participants’ reputations expand and they can be recognised as key members of the community, innovators, and major developers (Seely Brown, 2006). As learning organisations adopt and become reliant on open source software, they are entering a world where collaborative corporate models of innovation are the antithesis of the way these applications are

developed. There can be a strong possibility that the people institutions want controlled or constrained organisationally, concurrently receive community recognition as innovators and leaders (Pogrow, 2006). When learning institutions adopt this technology, they will need to reconcile the collaborative innovative organisational environment with the way the technology is evolved.

Meyer (2007) suggests there is an obligation of users of open source software to share, to support and to be participative with development. Seely-Brown (2005) says becoming a full-fledged member of a particular community of practice requires that you assimilate the sensibilities and ways of seeing the world embodied in that community. When learning organisations embrace the open source option instead of proprietary licences, they too have an obligation to support and participate in the development within a community that exists without any of the needs for sustainability and responsibility but through an adaptive process of natural selection. An important way in which they can respond to this obligation is to provide an environment where lone rangers, tinkering in the developmental role of resources, can function.

## Conclusion

There is a role, and an important one, for lone rangers tinkering with resources and applications within educational institutions because they can provide a link between innovation and experimentation with new technologies and applications, and responsible management. Learning organisations exist in a world of technology that demands both sustainable innovation and a moral responsibility to support the free, shared, and open resources which they use. In a competitive environment, learning organisations are also expected to provide curriculum and learning opportunities which embrace the constantly changing world. Anderson (1998) believes that this can only be done if organisations have a research and development capacity that can test, fail, and recover very quickly from experimentation with the disruptive technology on an exemplar small scale. They can do this by supporting those lone rangers tinkering with the technology.

Van Sciver (1998) believes that educators must become paradigm shifters who support freshly trained young people, older individuals shifting fields, mavericks, or tinkerers who create new technology. When learning institutions create this supportive environment, they can fulfil all their obligations to the growing world of open source development which so many have embraced. It could even be argued that the lone ranger tinkering and testing these applications is undertaking the organisation's moral and ethical responsibilities in using the products.

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