Innovative learning environments: Beginning with the concept

Jeremy Kedian[1] and John West-Burnham[2]
[1]Leadership Innovation NZ, New Zealand; [2]University of Worcester, United Kingdom

Abstract
There is an observable trend in a number of countries, of schools moving away from the traditional or industrial modes of school organisation and leaning towards what has become known as modern or innovative learning environments (MLEs or ILEs). This has created difficulties for educational leaders who have found the change problematic. This article addresses the need to develop an appropriate and comprehensive conceptual understanding of the ILEs in order to introduce a different learning model and environment. In this model the authors use the notion of architectures to describe the process of "building" the concept. They propose the development of learning, social, thinking, futures, organisational and physical architectures.

The article is speculative, yet includes appropriate theorizing. It acknowledges that the notion of ILEs is new, and requires time to be refined and embedded in existing educational systems.

Keywords: *Innovative / modern learning environments; learning architectures; social justice; learning; innovation in schools*

Introduction

As authors we acknowledge that any paper about the future is inherently speculative. Consequently, we cannot "know" the future, we can only wonder, share ideas and possibilities, and develop scenarios. In a scene from the 2017 film *Hidden Figures*, one character remarks to another that they do not have the mathematics to put a man into orbit around the earth. The rejoinder from the Al Harrison character is: "This is about inventing the Math, because without that we are not going anywhere." There is a sense in which this applies to Innovative Learning Environments (ILEs). There is an emerging literature, part of which has been written by academics observing this new phenomenon. Another part of the literature comes from those within the system who are educators in ILEs and theorising their experiences. Yet a third part represents a process of futures-orientated theorising that is speculative and attempts to support and extend the underpinnings of ILEs – inventing the future ILEs as places of learning. This article falls into this last category.

The current western schooling model is arguably predicated on an anticipation that the future will be similar to the past. However, the social contexts in which schools are located have changed substantially – values, technologies, international perspectives, changes in the nature and extent of future employment opportunities, neo-liberalism and other factors. School-aged children now live in a world of almost instant access to information, as the Internet usurps one of the core roles of the traditional school. While acknowledging that the ultimate purpose of education may well be social justice, it also includes a substantial element of preparation for the multiple futures in which current students will live and work. Professional educators need to ensure that they are preparing young people in the most effective way possible to address these future contexts. As the future remains an unknown, they face an impossible task. However, they need to engage in intelligent speculation that could inform their current practice, and not necessarily be constrained by what has happened in the past.

The future world of adulthood for current school students is likely to be substantially different to the present. Consequently, schools need to revisit their core functions and curriculum. With the availability of information, the focus should move away from transmission-based approaches to increasing learners' capacity to learn, analyse and synthesise. Arguably, the greatest legacy that schools can offer students is a deep

understanding of what it means to learn – to address the questions: What is learning? What is the best way for me to learn? What appropriate learning strategies exist that will work for me? What is the link between learning and critical thinking? Educational environments should be encouraging intellectual exploration, building creative capacity and experience, and urging learners of all ages to question and challenge the accepted. This will form the foundation for appropriate creativity in the future. Perhaps this significant shift in focus will become the disruptive change (Christensen & Overdorf, 2000) that alters our perspective of schools – a re-examination of the assumptions that underpin our schooling systems.

Identifying the issues

The pervasive neo-liberal, economic ideology challenges many prevailing orthodoxies – not least the concept of a governmental role in society. This essentially reductionist approach to public service would suggest that transmission-based approaches to learning are the most appropriate model for schools as it reflects a central theme of the neo-liberal approach – a combination of performativity and cost-benefit approaches. The validity of this approach is challenged by the prevailing educational hegemony that is made up of various assumptions which include our understanding of personal and curriculum context, knowledge, moral purpose, learning theory, equity and other core concepts. This alternative perspective argues there is a need to transform our current schools in a somewhat revolutionary way in order to meet the needs of future learners rather than the current view of meeting the needs of the market.

> Governments also face a challenge of whether school systems derived from the industrial era provide the capabilities – for curiosity, collaboration, and creativity – that are needed in modern, innovation-driven economies. There is a danger that schools are teaching children to get through tests and exams, but not imparting the social and entrepreneurial skills they will need to prosper. Schools might be hitting the target but are missing the point. (Leadbeater & Wong, 2010, p. 6)

The emerging model of school-based learning known variously as modern learning environments, innovative learning environments or flexible learning environments appears to reflect a growing groundswell of opinion that the traditional, factory model of schooling may no longer be the most appropriate learning model or environment for school-aged students. It reflects a necessary focus on the future of schooling as the needs of various societies change in order to adapt to a more global approach in an age of digital familiarity and accessibility, and changed ways of thinking about and prioritising students' learning. In addition, ILEs appear to prioritise notions of meta-learning and meta-cognition above the learning of curriculum directed "facts". The ILE as a system perhaps represents what Handy (2016) refers to as "second curve thinking" and an emancipatory approach to learning. In this way it is futures-orientated, highly functional and socially just.

This paper has its origins in two related areas. In the course of his consultancy and facilitation work with a group of New Zealand principals, Kedian discovered that a substantial majority had initial concerns regarding the expense of physical renovations to the school in order to accommodate the proposed new learning model. It was clear from these responses that their primary concern, at least in their initial thinking, tended to revolve around physical planning. When questioned about innovative learning environments at a conceptual level the principals expressed difficulty in describing a personal or organisational conceptualisation of the new model. The use of architecture stems from a paper presented by West-Burnham in 2000 at the South Australia Centre for Leadership in Education (SACLE) in Adelaide, and represents a way of conceptualising and constructing understanding of some core issues in the development of ILEs.

There is an emerging professional consensus that schools in their traditional form are no longer as fit for purpose as they were fifty years ago, and that change is both necessary and inevitable:

> I discern two legitimate reasons for undertaking new educational practices. The first reason is that current practices are not actually working. . . . The second reason is that conditions in the world are changing significantly. Consequent on these changes, certain goals, capacities, and practices might no longer be indicated, *or even come to be seen as counterproductive.* (Our emphasis) (Gardner, 2006, p.10)

It should be noted that the prevailing policy ethos for many Western education systems has been powerfully influenced by neo-liberal policies with their focus on managerialism, performativity and marketization (Thrupp & Willmott, 2003), which potentially compromises the intentions of school leaders and professional models of the moral basis of education. The level of prescription is obvious, student learning is subordinate to national policy and teachers are constrained in their ability to function as professionals as they "deliver" the curriculum. It seems that, in the traditional system, bureaucrats have a licence to control. Arguably, ILEs offer a counterpoint to the reductionist views of current educational leaders and policy makers.

A key element that encapsulates many of the tensions described so far is derived from two principles from business and architectural design – the related notions of "form follows function" and "fitness for purpose". There is the danger of post-facto rationalism here but in essence both argue that structures, procedures and relationships should be designed on the basis of clarity in defining function and purpose. Arguably the function of schools – the processes and procedures, key outcomes and defining purpose – have changed since the factory model was introduced over 150 years ago, yet the form has remained relatively unchanged. Many high tech business headquarters refer to being a campus – because the emphasis of the work is on creativity and innovation, not control.

The classic counter-example in the Anglophone world is the manufacturing business where the accountants and human resource staff have greater control than the engineers. Paradoxically in the neo-liberal public sector central government control, notably of the budget, means that the focus on performance is compromised by the retention of control over resources by the centre. This leads to an inevitable gap between espoused principle and actual practice that leads in turn to fundamental contradictions about the organisational nature of schools and the way they are led. It is therefore necessary to go through a period and process of fundamental, if not radical reconceptualisation. We hope that this paper contributes to the process.

Developing the concept

It is argued here that a conceptual understanding of ILEs is central to the effective development and implementation of a new schooling model. Anecdotally, it appears that many attempt to introduce such a modern learning environment in an incremental way without a clear understanding of the broader concept. Systemic change in western education systems has often been characterised by somewhat timid attempts and resulted in only minor shifts in emphasis that leave the essence of the 19th century model unchanged. This is often characterised as school improvement yet it portrays policy formulation as disjointed incrementalism – random shifts rather than coherent and integrated thinking.

The OECD publication (2013) on innovative learning environments lists seven core principles that underpin ILEs. These principles can be taken as the function and purpose referred to above and offer a coherent scenario as to the desired characteristics of education in the future. These are summarised as follows:

- maintain learners as core participants actively engaged in developing their understanding of learning,

- sustain the social nature of learning,

- teachers should develop a keen awareness of learners' motivations and emotions,

- develop a sensitivity to the individual differences between learners,

- develop demanding and challenging programmes for students,

- develop clear expectations of students, with congruent supporting strategies that include formative feedback,

- promote horizontal connectedness across the curriculum, community and global activities.

Table 1. Contrasting neo-liberal and social democrat perspectives on education

Focus	Neo-liberal/ neo-conservative perspectives	Social democratic perspectives	Resulting tensions
The sources of policy	Dogma and ideology, application of economic models to moral and social issues.	Humanistic philosophy, guided by evidence and professional practice.	Power and control vs consensus and trust.
The nature of society	Competition is the norm in personal, social and economic relationships.	Equitable and just with the state having a duty to intervene in society.	Centralisation vs devolution.
	The state should not interfere in the free market.	Fairness and social integration.	Individual vs community.
The purpose of education	To reinforce prevailing social norms and values.	Personal development and collective well-being.	Skills vs knowledge.
	To educate the future workforce.	Personal growth and potential.	Teaching vs learning.
	To embed social conventions.		
The role of government	To control schools in terms of legal status and finance.	To initiate intervention strategies.	Accountability vs professionalism.
	To initiate a self -improving school system.	To support schools through the provision of services and agencies.	
	To hold schools to account.	To increase funding.	
The role of schools	To provide cost-effective education.	To help secure personal growth and well-being.	Doing more with less.
The nature of an education system	To implement defined best practice.	To support the development of professional control and autonomy.	Independence vs collaboration.
	To develop a culture of performativity and accountability.		

The conceptual framework for an ILE-type school generally requires a change in philosophy, policy and vision unless, of course, it is a purpose built facility in a start-up phase. Even then, most countries have a dearth of professional educators with any substantial experience of innovative learning systems. Thus, developing an ILE is an opportunity to involve all professional educators on the staff in the conceptualising process. This draws on the thinking of the professionals who will be at the forefront working with learners.

Table 1 provides a tentative overview and analytical framework to understand the potential tensions between the social imaginary (Taylor, 2004) of the neo-liberal perspective and that underpinning the conceptual framework of an ILE.

A model such as an ILE inevitably creates artificial boundaries and overly simple definitions. Underpinning any such analysis are the fundamental assumptions, and the necessary conceptual understanding of a new model. Arguably, an innovative learning environment represents a changed philosophy as much as a change in the physical plant.

In order to create a conceptual representation of an ILE philosophy, the authors have used the notion of architecture, as referred to earlier, as an analogy.

Exploring the architecture

The use of the term architecture is intentional as it tends to evoke thoughts of meta-design, structural design, planning, style, construction, materials and many other elements generally associated with architecture.

A key concept that will be returned to in the next section is the notion of designing a context for learning using the concepts of architecture. The purpose and function of the concept of a family home are derived from very similar origins but have very different expressions in New Zealand, Italy, South Africa and the UK. The architecture of a building is about much more than its external presentation. It is about the ratios of space to different functions; it is about reconciling the efficient use of energy with aesthetic appeal; and it is also about identity, engagement and commitment. As buildings mature so they change; as the nature of our understanding of learning and the curriculum changes so should the spaces in which learning takes place.
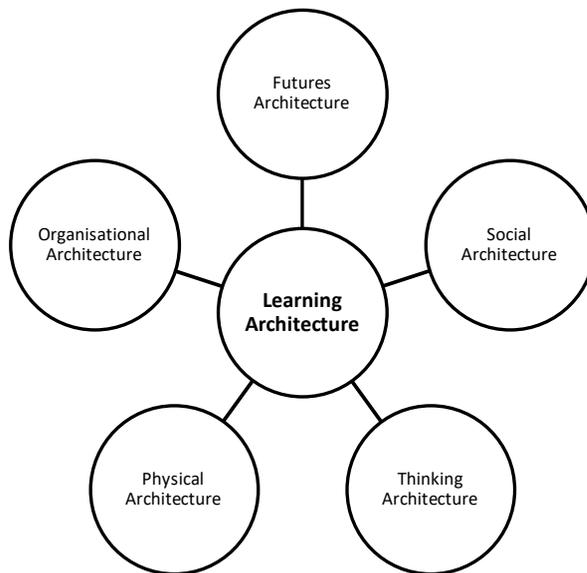

Figure 1: Components of a humanistic school learning model

Figure 1 offers a schematic representation of the elements of the suggested conceptual model. However, it can never represent the degree of interconnectedness and interdependence of the different architectures, not least of all as they may well differ from one context to another.

Learning architecture

This is the first and most significant of the architectures and, for obvious reasons, lies at the heart of any change to the schooling model. Learning is the primary activity in the school and should constitute the central pivot around which all other activities rotate. Currently, understandings of student-centred learning tend to be located in factory model thinking where the teacher remains the primary source of knowledge and has a role in both controlling and directing learning activities in the classroom. The ILE model represents a substantial change to the understanding of the style, design, materials and processes of the original factory model architecture.

An ILE learning architecture places responsibility for student learning with the students. Its intention is to assist learners to develop as confident, connected and expert learners who are committed to their personal growth. These students have the opportunity to "learn to learn" in a collaborative way. The collaborative element creates an environment in which it is possible for all learners to be caring and sensitive to their personal learning needs and the needs of fellow students. This empathy extends to recognising the funds of knowledge (Bishop & Glynn, 1999) that each learner brings to the learning space and/or group, and the ways in which their knowledge contributes to the overall learning programme.

It moves away from the false assumption that class attendance equals learning! There is an emphasis on how students learn, developing a personal learning vocabulary and understanding the utility of the strategies they employ as learners. This vocabulary and the metaphors used in the learning process potentially play an important foundational and creative role in the learning process. The focus is on developing an understanding of learning theory as the first step to becoming a successful learner. This metacognitive approach – the ability to reflect on their thinking and learning and, in so doing, to develop their personal ability to learn – is central to the learning architecture. This understanding has an emancipatory effect and arguably constitutes an early foundation for personal agency and self-sufficiency in an entirely changed world of work.

Creating a new and appropriate learning architecture is central to an ILE. There is only a relatively small and emerging literature that can assist educational leaders in developing a new learning philosophy and architecture. This is compounded by most teacher education institutions being somewhat slow to create a curriculum within their overall programmes to address new approaches, congruent with ILEs, that are substantially different to traditional classroom practice. Consequently, the majority of teachers who are not recent graduates from universities and other teacher education institutions have little or no experience of this new environment. In addition, many Western education systems have national policy guidelines that may not have kept pace with recent changes and require traditional forms of delivery and assessment that are contrary to ILE philosophies.

The substantial differences in classroom practice can create difficulties for teachers accustomed to a traditional model. There are also concerns regarding the effectiveness of an ILE. It is worth noting that the changes to the education system in England in the early 19th century – from a guild-based approach to learning to a factory model – took decades to implement and refine. As western systems now begin another phase of major change with the introduction of ILEs, there is an ethical dimension to change that requires appropriate research and the development of possible "fall-back" positions. However, crucial as the ethical dimension is, it should not be used as a reason for not implementing change.

A danger here is that teachers who are unfamiliar with the new model and encounter complications might see the "original" factory model – or status quo – as a default position to which they can revert when the new practice becomes too strange or difficult for them. In fairness to professional educators these tensions are bound to arise as a consequence of pre-service teacher education that is no longer appropriate or relevant. This

leads to inadequate conceptual frameworks developed in the school reinforced by inadequate theorising of their practice and a lack of appropriate professional learning opportunities. This situation is further exacerbated by a lack of opportunity in the workplace to develop ethical and appropriate risk-taking strategies, tensions arising from parental concerns, and a lack of support from school leaders and other sources. It is naïve to assume that this latest change can be free of any issues or tensions.

Many of the tensions stem from the potential performance of students when assessed using traditional methods against existing learning criteria that often focus on memorisation and understanding externally prescribed curriculum content. It is difficult to dismiss these concerns out of hand. There is undoubtedly a need for learners, especially in primary and secondary contexts to "learn" basic content. This simply cannot be avoided and nor should it be. However, the way in which this learning occurs could be substantially different. Effective learning activities in ILEs in New Zealand and some Australian states is predicated on the notion of "must do" and "can do" activities. This description represents the distinction between core curriculum content that must be mastered and those other areas that are relevant, yet perhaps tangential to the core content.

For students in most traditional schools there is seldom an explicit curriculum activity that supports the development of their understanding of learning theory, learning practices and strategies or an appropriate vocabulary to describe their learning. The lexis is considered to be of less importance than the curriculum content to be learnt. This suggests a fundamental contradiction. Students are required to "learn" or acquire curriculum content with little or no understanding of the process of learning, despite "learning" being the core element of the process. In addition, assumptions that underpin the value of the core content may no longer be valid.

Herein lies another of the key tensions underpinning most education systems in the developed world. The prevailing professional consensus, supported by a wide range of social agencies would argue that learning is a process that is supported by schooling in order to develop lifelong engagement with regard to:

- fulfilling personal potential and achieving academic success,

- developing lifelong habits of learning,

- developing a personal sense of ethics, and moral and spiritual confidence,

- understanding the significance of community and citizenship,

- fostering talents, creativity and innovation,

- working collaboratively.

All of these outcomes assume a focus on personal growth dependant upon developmental stage rather than a reliance on artificially homogeneous cohorts with automatic and generic progression determined by age.

Social architecture

It is generally acknowledged that learning is a social process (Mezirow, 1997, 2000; Siemens, 2005; Sousa, 2006). Nonetheless, it is still helpful to explore the social architecture of learning. It could be argued that each learner is exposed to multiple categories of teachers. We suggest there are perhaps five categories.

The first teachers are most typically the learner's parents. The role of parents in the educative experience of children is well-documented and should be highly valued (Vartuli & Winter, 1989; Cordry & Wilson, 2004). The second category of teachers might best be described as siblings, extended family and friends. Young people learn from this category of teachers in both conscious and subconscious ways. As with the parents, interactions with this category influence their ways of being, behaving, thinking, learning and engaging in social interactions. The third group of teachers are the professional educators they encounter from early years education activities to the end of their schooling or post-school opportunities. The fourth category is the learner's physical, emotional, and spiritual environment. The final category, and perhaps the vaguest, is the cosmos or metaphysical world. This

suggests a move away from rationality to a more Vygotskian approach (Berk & Winsler, 1995) acknowledging the social nature of learning.

Each one of these categories of teacher has the potential to exercise a substantial influence on learning. Each brings a profundity and simplicity, a richness and daily-ness to the learning of each child. Each brings a special and sometimes unique contribution to the process of learning and growing. Mezirow (1991) refers to learning as a process of coming into being. The contributions of all five categories of teachers assist the learner to come into being as a learner, an integrated member of society, and as a potential contributor to the learning of others. The social nature of this description suggests the centrality of relationships to learning – that learning occurs via the relationships that students develop with all of their teachers, and the learning process itself.

In many current education systems, the role of the teacher is to inform, "deliver" curriculum content, explain detail, support learning, assess and report on the student's ability to perform based on external and traditional norms and assessment criteria/activities. This is a traditional approach and, for many teachers, appropriate, and comfortable. It has a familiarity that is seductive in that is represents the known, the tried and the approved. The real question however should be, how effective is this approach to learning in a global community where digital accessibility is common for many western learners, and the traditional role of teachers as repositories and purveyors of information has been superseded by the Internet?

In an ILE, the role of the teacher focuses more on supporting learning in that the function becomes one of guiding and supporting the learning activities, creating opportunities and allowing students, while in the process of acquiring necessary curriculum content, to develop their capacity to learn and extend their range of learning strategies. It focuses further on developing the abilities of the learners in the area of critical discourse, where learners are more discerning and critical in their approach to information and its interpretation – to understand the changing conceptions of the world round them. Central to this is developing the learning relationships with students. In two schools encountered by Kedian, teachers were expected to enrol formally as students in a higher education institution. The purpose was two-fold: to demonstrate a personal commitment to learning, and to share with students their personal learning journey with all its attendant challenges and rewards. It was clear that this had a substantial impact on the learning relationships between all the learners – young and not so young.

The social architecture of an ILE assists in developing a shared understanding of the process of moving from knowing to wondering. In the current system the notion of "knowing" is highly valued. If a learner "knows" much of the curriculum content then the learner is deemed to be successful. In the post-school world it appears that the ability to be generative and creative is more highly valued. It would seem appropriate to develop a learning environment where this applies – where learners are encouraged to understand core curriculum requirements and also to value a broader, more exploratory approach to learning.
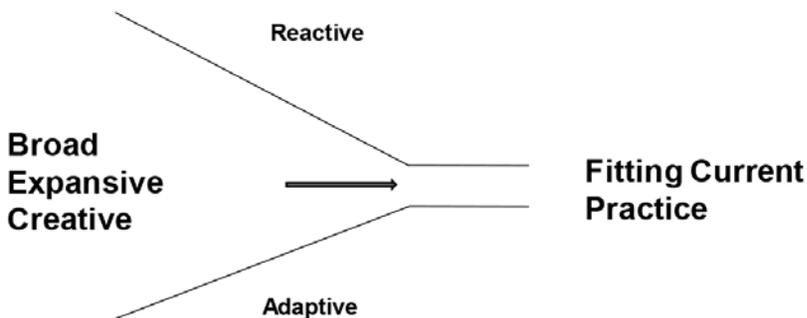

Figure 2: Conceptual filters

Figure 2 suggests the current model in which, due to pressures created by the extent of curriculum content and the ever-present tensions emanating from examination and reporting systems, potentially broad and creative learning opportunities are constrained by a system that requires uniformity and control.
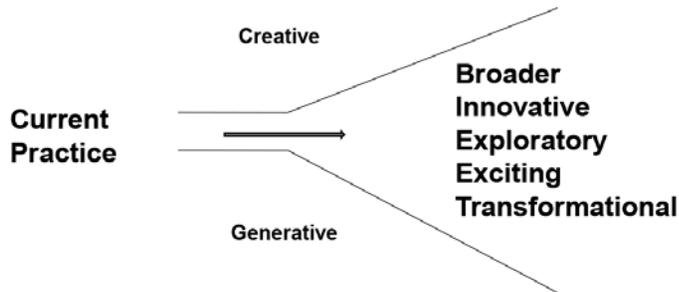

Figure 3: Professional possiblities

Figure 3, on the other hand, represents a broader, creative, generative model of learning in which the learner is able to explore learning possibilities and alternatives that are more transformational in nature. It allows the learner to explore, draw on multiple teachers, learn and still be able to acquire the prescribed curriculum content. It is this exploratory approach, combined with a well-understood learning vocabulary and appropriate learning strategies that enables the learner.

One way of understanding the relational aspects of a learning community is to think in terms of what is often described as social capital – essentially the quality of human relationships, the level of trust, the strength of social networks and the sense of being a significant part of a greater whole. Central to the key focus of this paper is the distinction to be drawn between a community and an organisation. Whereas most schools work as organisations, the ILE approach requires them to become communities. Hargreaves and Fullan (2012) reinforce the centrality of effective relationships in school leadership in terms of social capital but they raise the caveat:

> Unfortunately, the development of social capital as a strategy has not yet caught on in the teaching profession. . . . For us social capital strategies are one of the cornerstones for transforming the profession. Groups shape behavior much more than individuals – for better or worse. (p. 90)

It is worth stressing that while groups are very powerful they are often dominated by individuals, and the social dynamics of schools in particular reinforce the dominance of the individual.

One of the most significant components of social capital is relational trust. Bryk, Sebring, Allensworth, Luppescu and Easton (2010) demonstrate the very close relationship between the level and quality of relational trust in a school and its potential to improve. "Absent the social energy provided by trust, [and] improvement initiatives are unlikely to culminate in meaningful change, regardless of their intrinsic merit" (p. 157).

Trust is a powerful indicator of the differences between organisations and communities but there are a number of other variables that can help to inform our understanding of the nature of the social architecture of educational institutions. The issue of trust is perhaps compounded by personal experiences and understandings of the nature of schools and learning. These personal experiences are often the basis our understanding of what a school or learning should be.

Various philosophers (Taylor, 1996; Thompson, 1984; Deflem, 1996; Searle, 1995) suggest that social imaginaries are a group's (society's) representation and understanding of the symbolic world in which they live. It is a way of creating a shared understanding of the social and organisational symbols of a shared social

existence. From this perspective and as members of a western culture with a broadly shared understanding of what it is we understand by the term "school", members of western societies have developed a shared – and perhaps idealised – understanding of what a school is and what it means to learn in a school context. This has become part of our acknowledged social understanding. Consequently, we assume we "know" what it means to learn at school. This is arguably one of the strongest barriers to change in our education system. To change the nature of school – from a traditional factory model to an ILE – requires that we alter substantially our social imaginary of the nature and form of a school.

Table 2: Alternative social imaginaries of social architecture

Existing social imaginary of organisations	Emerging social imaginary of communities
Hierarchical silos	Systems networks and communities
Closed systems	Open systems
Dependency	Interdependency
Leadership as personal power	Leadership as collective capacity
Leader driven	Followership driven
Managerial efficiency	Social justice
Top down communication	Lateral communication
Organisation	Community
Manage information	Create knowledge

This view of social imaginaries suggests the importance of first developing a conceptual understanding of an ILE and reflecting on the elements of such a concept before implementing a new form of schooling.

A thinking architecture

This architecture is closely linked to the social architecture. It refers to the ways in which young learners think, behave, respond and believe. It refers to more socially orientated ways of thinking, connecting and being, rather than the more physiological and neurological theories of thought.

A substantial majority of teachers in Western education systems are over the age of 30. An equally substantial majority of learners are under the age of 15. It would be inappropriate to assume that the way in which these two groups "think" is the same. This reflects different values, beliefs, ways of being, attitudes and other factors.

The neo-liberal heritage of the last two decades has perhaps led us to believe in the primacy of the individual. Despite references to group learning and collaboration students are still regarded as individuals and are assessed as such. This thinking pervades the entire learning process.

We champion the cause of collaboration but in a school context the implications of this and any subsequent actions in the name of collaboration appear to be ill-defined. What is evident is that collaboration should occur throughout the school, noting that it may mean different things for school leaders, teachers, students and the parent community.

It appears that educators have high confidence in their understanding of how students should behave and relate in a learning context, but have low confidence in their understanding of how learners think. It would also

appear that there is an assumption that the way in which young people think is essentially a constant – that they think about their learning, both process and content, in the same way from early years until the end of their school careers.

As learners grow in terms of age and understanding, the value and belief systems must inevitably change with concomitant changes to the ways in which they think. These changes are likely to influence the ways in which they approach and utilise learning opportunities. In addition these systems surely alter the way in which they relate, not least of all to their school-based teachers. These changes in values and beliefs are likely to alter their perception of the world around them which in turn alters their priorities, interests and commitments. If the changed learning architecture leads to a more constructivist approach to learning, then these changed values and beliefs have the potential to alter their worldview and influence their learning directions. It should be self-evident that these new directions may not be entirely congruent with prescribed curriculum content. The effects of this in a traditional system could present in multiple ways from behavioural issues to demotivated learners. In an ILE context it could lead to extended learning, excitement and innovation for students and staff.

Table 3. Differences between learner and teacher digital preferences

Digital learners prefer:	Many educators prefer:
Receiving information quickly from multiple multimedia sources	Slow and controlled release of education from limited sources
Processing pictures, sounds, colour and video before text	To provide text before pictures, sounds, colour and video
Random access to hyperlinked multimedia information	To provide education linearly, logically and sequentially
To work simultaneously with many others	Students to work independently before they network and interact
Learning "just in time"	Learning "just in case"
Instant gratification with immediate and deferred rewards	Deferred gratification and delayed rewards
Learning that is relevant, active, instantly useful and fun	Teaching memorization in preparation for standardized tests

However it would be wrong to underestimate the tensions between the prevailing orthodoxy and the emerging alternatives. Jukes, McCain and Crockett (2010) argue for very different perspectives from the digital generation to more conservative views of the nature of teaching, learning and the curriculum. These differences are reflected in Table 3.

> Today's children are experiencing a digital world that is increasingly, and some would even say completely, out of sync with traditional approaches and assumptions about teaching, learning and assessment … our instruction is targeted at students from another age. (Jukes, et al., 2010, p. 41)

A futures architecture
Any concerted effort to develop a discourse about the nature of the future inevitably leads to reification – as though the future is actually available to us. Generally we tend to interact with the future in a way we believe allows us to influence it, even if we cannot control it.

The harsh realities of frenetic school days often create a context in which we forget that the purpose of learning occurring in schools is to prepare young people for their futures. Current international trends appear to favour what Handy (2016) refers to as "a DIY society". He suggests that many of the revered institutions that are apparently bastions of our culture – such as schools and universities, marriage, companies, and perhaps even friendships – are under threat. It is probably unlikely that these institutions will disappear entirely as they are likely to be replaced by somewhat more modern versions. However, we are preparing young people for a future that may look substantially different to our current national norms. The way in which we do things might be quite different.

Developing an education system that prepares young people for their futures is singularly difficult when one considers that the only thing we know for certain about the future is that it is unknowable! No doubt it will be different to the present and in all probability we will live in it. In a learning context, there is a danger in attempting to forecast the future that we could fall prey to the notion of technological determinism i.e. that the future will be all about technology which will exercise a disproportionate influence over our lives (Kedian & West-Burnham, 2010). Friedman (2006) suggests "Perhaps, contrary to what we have come to believe in recent years, people skills will become more valuable than computer skills. The geeks may not inherit the earth after all" (p.306). Friedman's questioning of the role of technology and reference to the importance of the relational and collaborative actions suggests a schooling model that embraces both relationships and collaboration.

As we can only speculate about the future it is important to move towards an educational model that focuses on learning. Arguably, the most significant legacy we can leave our students is a heightened understanding of, and ability to, learn. This is not a defeatist approach but rather one that recognises the rapidity of change, the need for young people to be critical thinkers, flexible, adaptable and highly skilled learners. It is this ability to learn that will underpin their capacity to adapt.

In order to support young people as they prepare for their futures, schools need to give serious consideration to integrating resilience, transformability and adaptability into the curriculum (Burke, Pierce, & Salas, 2006). These may seem obvious capacities but seldom appear explicitly in most western curriculum documents.

An ILE sets out specifically to develop these capacities. The learning model requires tenacity and resilience. As students take personal responsibility for their learning, so they rely less on teacher transmission and teacher intervention. The notion of the "learning pit" becomes very real. If they are struggling with the concept or process they may wallow in the learning pit for some time. The teacher as guide and mentor is unlikely to provide explicit information for the learning. The learners need to acknowledge and engage with their lack of understanding and develop strategies to overcome it. In many Western nations educators make use of the concept of "scaffolding". The concept is well understood to mean creating a cognitive or information framework in order to assist the student and make the learning process more efficient and quicker. One cannot help but speculate on the number of students who have been "scaffolded" out of their personal eureka moments! Arguably scaffolding, while applied with good intention, restricts the development of the learner's independence and personal agency – a concept fundamental to innovative learning environments. By developing the skills and capacities required for effective learning the students are preparing themselves to be effective adult learners in the future.

Organisational architecture

The organisational architecture of an ILE is different to that of a factory model school. There is no single prescription for this element, although it is important that the organisation becomes flexible, responsive and completely learner-oriented. There is an inevitability here that form and function of the traditional organisation must change.

As ILEs are an emerging form a substantial element of the organisation must focus on exploration, experimentation and learning. This may require a school that is becoming an ILE to ignore standard processes, policies, guidelines and approaches to schooling derived from a factory model setting. A significant element of the organisation's flexibility must be recognition that there is not yet a fixed format – and perhaps there never should be – for a "successful" ILE. It will recognise that the extent of teachers' experiences in this milieu is limited and that, at this stage, there is little assistance coming from teacher education institutions.

The lack of prescription is perhaps refreshing, just as the lack of critical research is somewhat concerning. However, this creates an opportunity for professional educators to lead the way, rather than conform to prescribed and constraining limitations. This leads to responsive and creative organisational cultures that, when confronted by a dilemma, are able to apply their professional knowledge and adopt an approach that acknowledges that "the answer is in the room" – that the professionals in the new context have a level of experience and expertise that allows them to develop and implement new directions in the interests of student learning. There is an inherent risk in this, although the benefits for student learning probably far outweigh any ethical concerns, as stated in the section on Learning Architectures.

This approach will influence significantly the culture of the organisation. The substantial changes to the nature of learning and the processes, the changed role of teachers, the higher levels of agenticism for students and teachers will all play a part in changing the culture.

This changed organisational approach will require school leaders to adopt a shared approach to leading. In addition, the priorities, nature and extent of the professional learning opportunities for staff will become more teacher-directed. This will require the members of the organisation to think more critically about the notion of collaboration and how this will appear in a learning and an organisational / leadership context. Ultimately, the organisation must be led in a manner that acknowledges and welcomes the new model, accepts the need for on-going organisational growth and change, is responsive to the new model and the ways in which it might change as it matures, and is responsive to the needs of both the students and their futures. It is the enabling cradle for student learning.

The physical architecture

It is no coincidence that the physical architecture is the last of the architectures we propose. It appears that, when considering the introduction of an ILE, various controlling bodies and school principals tend to reflect first on the need for physical planning and alterations to existing school buildings. This is perhaps a consequence of addressing the easily perceived rather than the more abstract conceptual issues.

An ILE is essentially a concept, not a physical plant. Arguably it is this focus on the immediate need for some form of physical change rather than addressing the complexity of the concept that potentially impedes the development of an ILE. The essence here is that the plant should be "fit for purpose". Following on from this it seems that some changes to the physical plant are useful. These changes are not massive but rather constitute minor alterations to some spaces in order to create some larger, more flexible learning areas where possible.

As with any learning area, the ideal consists of spaces that are inviting, flexible, and interchangeable. They should be appropriately furnished and responsive to the needs of the learners. Indeed, many schools that are moving towards an ILE philosophy have succeeded in making only minor alterations to buildings, but have rather made substantial changes to the furniture in order to create learner-friendly spaces with appropriate adjacencies.

An ILE philosophy recognises that all categories of teachers contribute to the learning of an individual student and consequently acknowledges that not all learning occurs on the school's campus. The notion of students leaving the school campus during the day in order to facilitate their learning, while a simple idea, frequently

requires a radical departure from current school policy. This departure from current norms is replicated in a number of other areas and requires school boards / governors / trustees to re-address their policies.

The internal design of learning spaces is potentially quite different to a normal classroom and should be explicitly introduced to learners. Anecdotal evidence suggests that learners require an opportunity to move beyond the novelty of different furniture to the utility of the learning space, making decisions about how these spaces will best suit their needs. In addition many ILE spaces present something of a challenge to teachers familiar with the traditional classroom. It is common for these new learning spaces not to have a "teacher's desk" area. This emphasizes the learners' ownership of the learning spaces and is predicated on the assumption that the total space should be dedicated to student-centred learning activities.

Conclusion

This article is unashamedly speculative. It has presented a possible conceptual framework for an ILE, one that creates an opportunity to grow an understanding of a new schooling model and aid thinking about possibilities.

It is certain that this new model will grow and mature over a period of time – perhaps as much as a decade or two. Perhaps the essence here is to accept that there is not yet an "approved" model, and that the ILE is a concept, not a building or fixed form. While the fixed nature of the new form is perhaps inevitable, this can be ameliorated provided that the ILEs retain their flexibility and responsiveness to the needs of learners.

One thing remains certain: the future will be different from the past and we must prepare students to live and work in a fulfilling way in their futures. In exactly the same way that buildings change (from church to community centre, from family home to student flats, from office block to hotel), the success of the change is entirely contingent on reconceptualising the architecture in order to rethink the norms, patterns and structures of the historic architectural assumptions.

References

Berk, L., & Winsler, A. (1995). *Scaffolding children's learning: Vygotsky and early childhood education.* Washington, DC: NAEYC.

Bishop, R., & Glynn, T. (1999). *Culture counts: Changing power relations in education*. Palmerston North: Dunmore Press.

Bryk, A. S., Sebring, P.B., Allensworth, E., Luppescu, S., & Easton, J.Q. (2010). O*rganizing schools for improvement: Lessons from Chicago*. Chicago, IL: University of Chicago Press.

Burke, S., Pierce, L., & Salas, E. (2006). Adaptability: A prerequisite for effective performance within complex environments. *Advances in Human Performance and Cognitive Engineering Research, 6*, v-vi.

Christensen, C.M., & Overdorf, M. (2000). Meeting the challenge of disruptive change. *Harvard Business Review, 78*(2), 66-76.

Cordry, S., & Wilson, J.D. (2004). Parents as first teacher. *Education, 125*(1), 56-62.

Deflem, M. (1996). *Habermas: Modernity and law*. London: Sage.

Friedman, T.L. (2006). *The world is flat.* London: Allen Lane.

Fullan, M. (2001). *The new meaning of educational change*. New York, NY: Teachers College Press.

Gardner, H. (2006). *Five minds for the future.* Boston: MA: Harvard Business School Press.

Handy, C. (2016). *The second curve: Thoughts on reinventing society*. London: Random House.

Hargreaves, A., & Fullan, M. (2012). *Professional capital*. Abingdon: Routledge

Jukes, I., McCain, T., & Crockett, L. (2010). *Understanding the digital generation: Teaching and learning in the new digital landscape*. Melbourne: Hawker Brownlow Education.

Kedian, J., & West-Burnham, J. (2010, March). Contextualizing education and the future. Paper presented at *International Leadership Institute*. Hamilton, New Zealand.

Leadbeater, C., & Wong, A. (2010). *Learning from the extremes.* London: Cisco Publications.

Mezirow, J. (1991). *Transformative dimensions of adult learning*. San Francisco, CA: Jossey Bass.

Mezirow, J. (1997). Transformative learning: Theory to practice. *New Directions for Adult and Continuing Education, 74*, Summer, 5-12.

Mezirow, J. (2000). *Learning as transformation. Critical perspectives on a theory in progress.* San Francisco, CA: Jossey Bass.

Organisation for Economic and Co-operative Development (OECD). (2013). *Innovative Learning Environments*. Paris, France: OECD Publishing.

Searle, J. R. (1995). *The construction of social reality*. New York, NY: Free Press.

Siemens, G. (2005). Connectivism: A learning theory for the digital age. *International Journal of Instructional Technology and Distance Learning, 2*(1), 3-10.

Sousa, D. A. (2006). *How the brain learns mathematics.* Thousand Oaks, CA: Corwin Press.

Taylor, C. (1996). *Sources of self: The making of modern identity*. Cambridge: Cambridge University Press.

Taylor, C. (2004). *Modern social imaginaries*. London: Duke University Press.

Thompson, J. B. (1984). *Theories in the study of ideology*. Berkeley, CA; University of California Press.

Thrupp, M., & Willmott, R. (2003). *Educational management in managerialist times: Beyond the textural apologists*. Maidenhead: McGraw-Hill Education.

Vartuli, S., & Winter, M. (1989). Parents as first teachers. In M. Fine (Ed.). *Second handbook on parent education* (pp. 99-117). New York, NY: Academic Press.

Authors

Corresponding author

Jeremy Kedian, FNZEALS and Hon Fellow Sheffield University, has recently retired as senior lecturer and manager of the Educational Leadership Centre at the University of Waikato in New Zealand. He retains a strong interest in innovative learning environments and other areas of research and practice. He is currently a director and senior consultant for Leadership Innovation NZ, an organisation committed to building leadership capacity in organisations using dialogic and mentoring approaches. He has had substantial experience in the theory and practice of innovative learning environments and is currently supporting a number of schools making the transition from traditional to more innovative approaches.
Email: jeremy@leadershipinnovationnz.co.nz

John West-Burnham, FRSA is an independent writer, teacher and consultant in education leadership with a particular interest in leadership learning and development and innovative approaches to learning in schools and communities. He has been a schoolteacher, teacher trainer, education officer and has held posts in six universities. John is the author or editor of 28 books including *Understanding Leadership* and *Leadership Dialogues* and he has worked in 27 countries. He is Honorary Professor of Education at the University of Worcester.
www.johnwest-burnham.co.uk