

The Governance of Innovation in Education¹

Lucie Cerna*

The education sector is often considered not prone to innovation. However, recent research indicates that education can be as innovative as other sectors, if the right conditions and governance structures are in place. This article examines the governance of innovation in education systems. It traces the role of innovation for education, presents how innovation is measured and analyses how it can be governed successfully. Education systems operate under considerable governance complexity which has consequences for questions of accountability, trust, professionalism and leadership. This article proposes a simple framework of different governance elements and examines what kind of accountability, leadership, trust and professionalism may be suitable to promote and sustain innovation in education. The article indicates that, for instance, horizontal accountability combined with strong professionalism and trust may generate a culture of innovation, especially when supported by strong learning and political leadership. Nonetheless, the context and specific conditions in countries and education systems need to be taken into consideration as there is no one-size-fits-all solution. The findings are based on OECD publications and existing literature on education, governance and innovation.

Keywords: education, governance, innovation, reform, OECD

Introduction

The education sector is often regarded as not prone to innovation. In recent years, many policy-makers have complained that the education system is conservative and teachers are resistant to change. However, employers lament that schools do not produce workers with the right sets of skills. Education is seen as losing the race with technology, not able to keep up with skills demands of 21st century economies (Van Damme, 2014).

But is this true? A new OECD (2014a) report on measuring innovation in education shows that the education sector is as innovative as other public sectors. In addition, many innovations take place in schools and classrooms, with teachers and school leaders creating innovative learning environments. Education policies can help create favourable conditions for innovation, even though there are also examples where policies have led to top-down regulation and compliance to status-quo rather than creating spaces to experiment and generate trust needed for innovative approaches (Van Damme, 2014).

In many cases, education systems uphold organisational culture, accountability models and historical traditions which encourage obedience and discourage risk-taking. The question of innovation in education becomes a question of governance of reform. More specifically, what kind of accountability mechanisms would foster innovation and encourage risk-taking? What policies can shape a culture of trust where innovation can flourish? How can the teaching profession be a driver of educational innovation? What type of leadership do policy-makers need to develop in order to create a culture of innovation? To answer these questions, it is important to understand contemporary complex education systems, which are multi-dimensional in nature. Many different

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* Lucie Cerna: OECD Oktatási Igazgatóságának elemzője, lucie.cerna@oecd.org

drivers have to work together in such systems to create open and innovation-friendly environments (Van Damme, 2014).

In this vein, the article highlights existing scholarship on the governance of innovation in education and draws linkages between different governance elements in a more systematic way. The article proceeds as follows: first it traces the role of innovation for education, and then it presents how innovation is measured before analysing how innovation in education may be governed successfully. This article proposes a simple framework of different governance elements and examines what kind of accountability, leadership, trust and professionalism may be suitable to encourage and sustain innovation in education. The findings are based on OECD publications and existing literature on education, governance and innovation.

Innovation, governance and reform

Even as far back as the beginning of the 20th century, Dewey (1916) wrote that the school was the most conservative institution in the United States and was being used to hinder the correct attainment of the democratic ideal. Despite this, he stated that schools had the potential to become the most radical of all institutions and could be drivers of real change. The main goal of progressive education, in his view, was to turn the school into an instrument of social reform. Almost a century later, the tension between radicalism and conservatism continues to run through the field of innovation, governance and reform.

There is a strong link between reform, governance and innovation (Istance, in communication). Reform is about policies that set the ground rules and frameworks, and help establish priorities and conditions. Governance refers to organised decision-making relations in the service of aims and good functioning. Last, innovation is the increasingly important renewal that takes place within these parameters, given the demanding, rapid-changing nature of learning systems. The next sections analyse these interconnections further and examine them across systems.

Innovation

Innovation is seen as any kind of dynamic change that is intended to add value to the educational processes – this can apply to different levels, ranging from systemic to classroom innovation. More precisely, the Oslo Manual defines innovation as “the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations” (OECD & Eurostat, 2005, p. 46).

Though the terms are often used interchangeably, it is important to distinguish innovation from reform and change. Most of the literature defines innovation as the implementation not only of new ideas, knowledge and practices but also of improved ideas, knowledge and practices (Kostoff, 2003; Mitchell, 2003). Innovation is thus different from reform or change, as the latter terms do not necessarily mean the application of something new, nor do they imply the application of improved ideas or knowledge (King & Anderson, 2002). However, in practice it is difficult to know whether something is an improvement over an existing situation (Kools, forthcoming).

Melchor (2008) suggests that reform is only one way of producing change; it implies a special approach to problem solving. Sometimes changes in organisations are key parts of reform but other reforms produce little or no change at all. Whereas change as transformation or alteration may be an intended or unintended phenomenon, reform is a structured and conscious process of producing change no matter its extent. Reforms can occur in political, economic, social and administrative domains, contain ideas about problems and solutions and

are typically understood as initiatives driven from the top of a system or organisation (Kools, forthcoming). The following Table 1 provides a comparison of the three terms.

Table 1. Innovation, reform and change in comparison.

	Innovation	Reform	Change
Definition	Implementation of improved ideas, knowledge and practices	Structured and conscious process of producing change no matter its extent	Transformation or alteration that may be an intended or unintended phenomenon
Key characteristics	Implies novelty and brings benefits	Produces change (though in some cases only little or none)	Is historical, contextual and processual
Types	Process, product, marketing and organisational Also: incremental, radical and systemic form	Radical, incremental or systemic	Differentiated by pace (continuous or episodic) and scope (convergent or radical)

Note: Compiled from Butler, 2003; Kools, forthcoming; Kostoff, 2003; Melchor, 2008; Mitchell, 2003; OECD, 2009; OECD and Eurostat, 2005.

Overall, innovation is the main driver of progress in all aspects of human and economic activity. Demographic pressures, social and economic pressures to raise achievement levels and ensure greater equity of outcomes, rapidly advancing technologies, growing demand for government services, higher public expectations and tighter fiscal constraints have created a need for innovative solutions in the public sector to increase productivity, keep costs down and raise public satisfaction (OECD, 2014a, p. 22; Looney, 2009).

Innovation matters for the education sector for several key reasons (OECD, 2014a, p. 22):

1. Educational innovations can ameliorate learning outcomes and the quality of education provision. For example, changes in the educational system can facilitate adapting the educational process. New trends in personalised learning depend considerably on new school organisations and the use of information and communication technology (ICT).
2. Education is seen in most countries as a way to improve equity and equality of learning outcomes and learning opportunities, and the Programme for International Student Assessment (PISA) results provide evidence for this (OECD, 2012; 2013d). A recent project at the OECD (2014a) investigating the measurement of innovation in education indicates that education systems that have innovated the most have also been the most equitable and equal in terms of learning outcomes and opportunities.
3. Public organisations are, like businesses, under pressure to improve efficiency, minimise costs and maximise value for money. Mulgan and Albury (2003) point out that costs in public services have risen faster than in the rest of the economy, including education. This could be due to the nature of public service provisions facing rising labour costs and limited scope for productivity gains (see Baumol, 1967) but it could also be due to a lack of innovation (e.g. Foray & Raffo, 2012). Innovation is often seen as a stimulus for more efficient provision of public services.
4. Education should remain relevant in the face of rapid changes to society and the national economy (Barrett, 1998, p. 288). Thus the education sector has to introduce changes that allow it to respond to societal needs. For instance, education systems should adopt teaching, learning or organisational practices that have been identified to help fostering 'skills for innovation' (Dumont et al., 2010; Schleicher, 2012;

Winner et al., 2013). Results from several international surveys (such as PISA) highlight the need for innovation to improve literacy, numeracy and scientific literacy in many countries (OECD, 2014a).

Despite the previously mentioned benefits of innovation, innovation is not always a systemic feature of education because there are several interrelated barriers (OECD 2009; 2013a). First, there is the inherent conservatism found within organisations and in the wider community summed up as 'preference for the status quo'. The second barrier is bureaucratic behaviour, which applies to hierarchical organisations where conformity to rules and regulations is encouraged instead of other forms of risky and disruptive behaviour. Third, structures and organisational cultures for innovation might be inappropriate. Fourth, results of innovations are uncertain, which increases the difficulty of winning support for innovation and adds complex issues from multiple sectors and several other stakeholders with their own agendas and timelines. Policies to improve learning innovation need to address these barriers and promote such innovation positively (OECD, 2009).

Measuring innovation

Despite the highlighted challenges in the preceding sections, attempts to measure innovation in education at the OECD Centre for Educational Research and Innovation (CERI) show that education is often as innovative as many other public policy sectors. One recent OECD/CERI project set out to measure innovation in education and other sectors. While findings depend on how innovation and practices are defined, its report² highlights that innovation intensity is greater in higher education, with secondary and primary education approximately equal. Compared to other sectors, knowledge and method innovation³ is above average in education; product and service innovation is below average, while technology innovation is at the average sectorial level (OECD, 2014a). Nonetheless, there are considerable differences across countries in the reported levels of innovation.

Distinguishing between classroom and school practices, innovation has been higher with regards to the former than to the latter between 2000 and 2011 (see Figure 1). In a composite innovation index which takes all indicators together, 13 out of 28 education systems are above the OECD mean (22 points) in terms of the extent of change across school and classroom practices. Countries in which there has been the most innovation at the classroom and school levels in primary and secondary education include Denmark (37 points), Indonesia (36 points), Korea (32 points) and the Netherlands (30 points). Countries with the least innovation include the Czech Republic (15 points), Austria (16 points), New Zealand and the United States (both 17 points) (OECD, 2014a).

2. The report captures innovation as a significant change in some key practices in educational establishments by drawing on the PISA, TIMSS and PIRLS databases. The indicators report information about which practices have changed and which have remained constant. The focus of the practices lies on school and classroom change (or innovation) (OECD, 2014a).
3. REFLEX (2005) and HEGESCO (2008) surveys asked higher education graduates five years after their graduation "How would you characterise the extent of innovation in your organisation or your work?" regarding "product or service", "technology, tools or instruments" and "knowledge or methods" innovation.

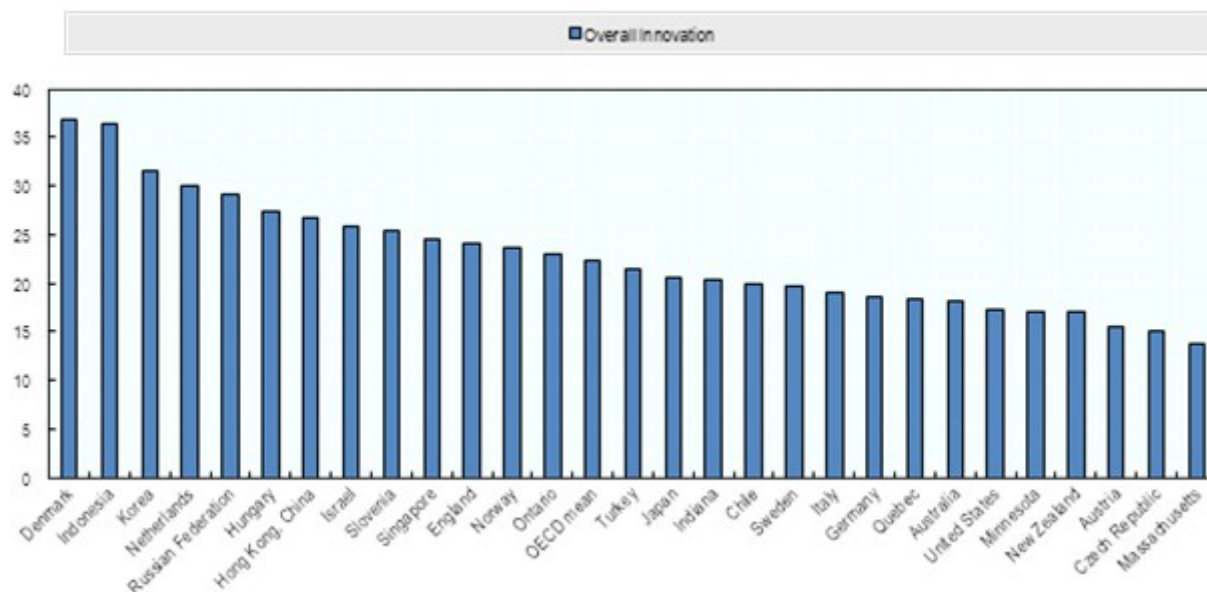


Figure 1. Overall composite indices for period 2000–2011. Source: OECD, 2014a.

Innovative learning environments

Overall, many innovations are taking place in schools and classrooms, led by teachers and inventive school leaders creating innovative learning environments (ILE). A *learning environment* can be understood as an “organic, holistic concept that embraces both the learning taking place and the setting in which it occurs: an ecosystem of learning that includes the activity and outcomes of the learning. It recognises that context is essential in the contemporary understanding of learning” (OECD, 2013a, p. 11; see also de Corte, 2010).

Figure 2 demonstrates the ILE framework which comprises three components, layers or cycles: the ‘pedagogical core’, the ‘formative cycle’ within the organisation (learning leadership and design, evaluation, feedback and redesign), and ‘partnerships’ (ILE, 2013a, p. 186). The pedagogical core is composed of four elements: the student as a learner, the teacher as a learning professional, resources and facilities for learning, and the content of learning such as developing 21st century competences (Dumont & Istance, 2010; OECD, 2013a). The second part of the core is made up of relationships and dynamics that combine the elements together in particular ways. These can be grouped under ‘organisation’ and ‘pedagogies and assessment practices’. The basic core is extended in two ways. An agency in shaping the environment’s direction is influenced by the leadership and organisational strategy, the learning that takes place and how this is acted on by the learning environment as an organisation. The third component of the ILE definition of learning environments are the connections and partnerships which exemplify the diversity of sources and tightness of boundaries of learning environments (ILE, 2013a, pp. 24–25). The learning environment can have connections with families of the learners and communities; partnerships with business, cultural institutions and higher education; and other learning environments.



Figure 2. ILE Framework. Adapted from *Innovative Learning Environments* (p. 128), by OECD, 2013, Paris: OECD Publishing. Adapted with permission.

There are numerous examples from schools and classrooms that are considered innovative in their own context (OECD, 2013a). In some cases, there is a fundamental difference in approach, practice or culture from the main educational provision, in other cases it is less fundamental (OECD, 2013a). For instance, *Europaschule Linz* in Austria is innovative within the Austrian school system due to its individualised approach to learning. Another example is the principle of open doors at the *Instituto Agrícola Pascual Baburizza* in Chile as it is rather unusual for upper secondary schools in the country (OECD, 2013a).

Innovations are not necessarily judged by whether they are new or unique, but instead about how different approaches are combined to a whole. For example, the stakeholders of *Lobdeburgschule* in Thuringia, Germany, have regarded innovation as the combination of the orientation on specific learner's abilities and the use of proven elements to gain novel changes (OECD, 2013a, p. 27). Many of the practices can be found elsewhere and there is not one single solution. However, it is important to think about environments instead of practices and about ways in which particular practices fit into that larger whole (OECD, 2013a, p. 27).

Reform

The nature of policy-making and implementation of educational reform is complex. How can reform take place? Existing research indicates that reforms usually happen due to a combination of enabling factors, seated in shifts in stakeholders' values and beliefs and windows of opportunity for action which occur unpredictably and require the timing of initiatives to be just right (Cerna, 2013). However, some research also indicates that policy continuity with the status quo is more likely than reform because of the challenges of creating the right conditions and getting stakeholders who favour policy change on board. Predicting policy reform in this environment is problematic as so many factors must be brought in alignment, but reform of any kind does require that the governance structures create an enabling environment that fosters change.

In the end, policy reform is a political process (Cerna, 2013). Reich (1995) argues that for reform to succeed, policy-makers need effective methods to analyse relevant political conditions and shape key political factors in favour of policy reform. Political timing provides opportunities for policy entrepreneurs to introduce ideas into the public debate and political management of group competition allows leaders to control the political effects of distributional consequences and protect the regime's stability (Reich, 1995). The opportunity to achieve policy reform is often affected by external events. For instance, change is more possible at the beginning of a regime, and major concurrent events can open up political windows for reform. Radical changes require careful consideration of timing, while minor incremental changes are not as dependent on timing (OECD, 2009).

The politics of reform highlights that political will, favourable timing and suitable institutions are needed in order to push through change. The role of policy entrepreneurs is key in seeking out windows of opportunity. But passing reforms is not sufficient for the effective implementation of policies. Classrooms, and indeed educational systems, have to be 'recultured' to operate in the new contexts created by the reform (Fullan, 2007). As a result, a number of conditions have to be satisfied to enhance the change of successful and sustainable implementation, though these conditions vary across systems and across reforms. Reforms to date have had difficulty to make lasting impact due to the reoccurring issue of unchanging organisational cultures.

The education sector may be distinct from other public sectors due to several factors such as teachers' resistance to reform; the need for cooperation with providers who can sabotage reforms; strong unions of teachers; the implications of timing for election cycles and reform processes; uncertainty among different stakeholders with stakes in education; multiple levels of governance contributing to uncertainty and complexity of the system (see OECD, 2010).

Due to these factors, resistance to education reform is often the issue highest in the mind of reform-minded decision makers. The education environment is in certain respects distinct from that faced by policy-makers in other areas, because of the large scale of the education enterprise (see OECD, 2010). Overall, it is difficult to assess the relative costs and benefits in education because of the large number of intervening variables that influence nature, size and distribution of benefits of reform (OECD, 2010).

Although it remains true that innovation is often not a systemic feature of education, innovative practices occur with great frequency in a multitude of contexts within the sector and with proper governance structures and a deeper understanding of the complexity at play innovation can perhaps be brought to scale to reshape 21st century education.

Governance

The drive to innovate raises fundamental questions about governance of reform and decision-making. It touches upon several elements of complex governance systems, including accountability, leadership, trust and professionalism. While the literature often analyses them in isolation, Figure 3 demonstrates that several presented elements are interlinked with innovation and between each other in a complex web of governance. These interactions are examined further in the following sections.

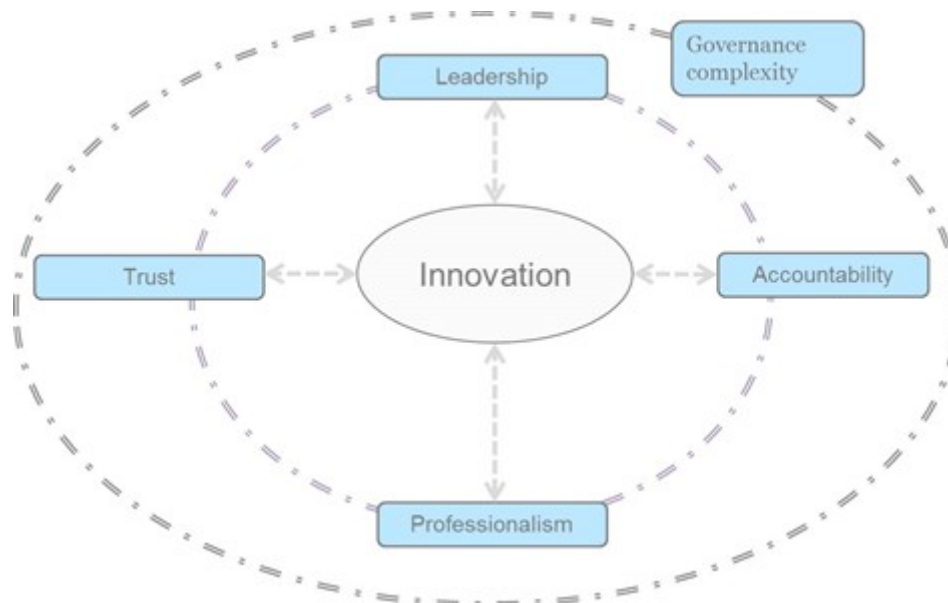


Figure 3. Key elements in education and innovation.

Complexity

In order to answer the questions on the forms of accountability, leadership, professionalism and trust which would best foster innovation, it is important to better understand the complexities of contemporary education systems. In such systems, many different factors have to work together to create open and innovation-friendly environments.

Education systems used to be explained either through top-down (the government implements innovations which are trickled down through the system) or bottom-up (innovations at the local level are scaled up) approaches. But they are now characterised by multi-level governance⁴ where the links between multiple actors operating at different levels are to some extent fluid and open to negotiation (Burns & Wilkoszewski, 2013). The nature of the relationship between central, regional and local levels has changed with different funding mechanisms, strengthening of stakeholders, horizontal accountability, and holding local authorities and schools accountable through performance indicators (Burns & Wilkoszewski, 2013). This contributes to systems complexity.

Complexity in education systems has become more visible due to a number of intersecting trends, such as more diverse stakeholders' preferences and expectations; more decentralised and flexible governance structures; increased importance of multiple levels of governance; rapidly changing and spreading ICTs; internationalisation of education and growing demand for lifelong learning which lies outside the formal policy domain (see Fazekas & Burns, 2012; Halász, 2003; Hodgson, 2000; OECD, 2007).

For instance, stakeholders in education have become more varied and now include parents, teachers, principals, municipalities, government (including all state and sub-state agencies), students, media, private actors, foundations, community, international organisations, universities, social partners (employers' associations, unions) and researchers. Stakeholders do not operate by themselves or in a linear way, but in more complex, inter-

4. It is "an arrangement for making binding decisions that engages a multiplicity of politically independent but otherwise interdependent actors – private and public – at different levels of territorial aggregation in more-or-less continuous negotiation/deliberation/implementation, and [...] does not assign exclusive policy competence or assert a stable hierarchy of political authority to any of these levels" (Schmitter, 2004, p. 49).

active and flexible patterns, such as through formal or informal networks, learning communities, learning environments and learning organisations.

Existing models might no longer be appropriate as they are overly mechanistic and oversimplify the reality. Complexity allows for the recasting of standard approaches. But how can complex systems be defined? Sabelli (2006) cites a useful definition by Kaput et al. (2005) to identify some core components of a complex system:

- the interconnected components' behaviour is not explained by the properties of the components, but rather emerges from the interaction of the components;
- the system is non-linear and relies on feedback to mould and shape its evolution; and
- the system operates on multiple time-scales and levels simultaneously (Snyder, 2013).

Complex systems do not work in a linear manner but rather exhibit a series of well-defined characteristics: tipping points, feedback loops, path dependence and sensibility to local contexts (Byrne, 1998). Complexity theory suggests that systems begin as collections of individual actors who organise themselves and create relationships. These relationships form in response to positive or negative feedback – which are key to successful management in a complex system. New structures and behaviours then emerge as the actors act and react to each other, necessitating some degree of flexibility (Snyder, 2013). The centre can create a fertile environment that embraces the emergent nature of complex systems and work to create processes that maximise the flow of feedback between and across levels in a safe and manageable space. This will allow for self-organisation in which structures will emerge from the collaboration of all stakeholders (Morrison, 2010).

Overall, governments can respond to complexity through artificial reduction (such as modernising qualification systems and making them more transparent) or the introduction of coping mechanisms. Halász (2011) has analysed complexity and employer engagement in the English vocational and education training system. One of the solutions was to create and sustain innovative mechanisms that allowed those who led and managed the system to cope with complexity and uncertainty. A new regulatory environment was established which enabled the expression of employer needs in different ways and at different levels – in order to achieve greater flexibility.

Policy experimentation has been proposed as another strategy to respond to increasing complexity, and has been applied, to varying degrees, across OECD and non-OECD countries (such as a horizontal curriculum reform in China). Policy experimentation can be defined as “a purposeful and coordinated activity geared to producing novel policy options that are injected into official policymaking and then replicated on a larger scale” (Heilmann, 2008, p. 3). This implies the deliberate implementation of a new programme or practice on a small scale, targeting a selected number of schools or districts, with the intention of evaluating the effectiveness and possible scaling up to a wider level (for a more detailed discussion, see Blanchenay and Burns, forthcoming).

In complex, knowledge-based learning systems evaluation is central to activity and direction. It is used to determine whether original goals have been met, but is also part of a much wider activity of experimentation in policy and practice in which it is providing spot checks about progress to inform further progress rather than definitive answers in rapidly changing circumstances to original ambitions formulated several years before (see Earl & Timperley, 2014). This highlights the shift from summative to formative approaches.

Accountability

Complexity poses several challenges for accountability. Accountability can be defined as “holding those actors delivering governance to the society to be accountable for their actions” (Pierre & Peters, 2005, p. 5). When governments grant some autonomy to municipalities or schools, there are greater demands to monitor and hold them accountable. It has been argued that accountability pressures have often led to an over-investment in test-

ing and regulatory control (see Fullan, 2011). As such, a high degree of accountability can stifle risk-taking (Giddens, 1990; Reina & Reina, 2006), which is key for innovation.

What kind of accountability mechanisms would instead foster innovation and encourage risk-taking? There are no simple answers, since differently performing schools may need different accountability systems (Hooge, Burns, & Wilkoszewski, 2012). For instance, Elmore (2002; 2008) argues that schools require strong internal accountability systems in order to respond in effective and coherent ways to externally administered incentives in accountability systems. To achieve an effective improvement process, schools and systems need to have internal capacity to process the message of an external incentive and put it into an effective course of action (Elmore, 2002). However, this is difficult to achieve without a culture change. The institutional school system could develop into new forms of learning and thus some flexibility in approaches and structures is required.

Different types of accountability can have varying effects on innovation. There has been a move in some OECD countries to expand accountability to multiple approaches which link data from school performance measures with assessment and feedback from other sources (such as elements of multiple accountability) (Hooge, Burns, & Wilkoszewski, 2012).

In general, it might be fruitful to combine vertical accountability (i.e. top-down and hierarchical, enforcing compliance with laws and regulation and/or holding schools accountable for the quality of education they provide) with horizontal accountability, which assumes non-hierarchical relationships and can promote innovation in a high-trusting environment where teacher professionalism is valued (for more information, see Hooge, Burns, & Wilkoszewski, 2012). This combination could build an efficient and effective accountability system that considers different purposes of education. This could help improve the overall education system, policy for reform, and in the end improve the quality of education (Hooge, Burns, & Wilkoszewski, 2012).

Trust

What kind of policies can shape a culture of trust where innovation can flourish? Even though "everyone knows what it is, articulating a precise definition of trust is no simple matter, whether the context is interpersonal, organisational or societal" (Hoy & Tschannen-Moran, 1999, p. 185). Different forms of trust are evident, ranging from interpersonal, organisational to institutional trust, which creates further challenges (Cerna, forthcoming).

Broadly, trust has three constituent parts: "an expectation, a willingness to be vulnerable and a risk-taking act" (McEvily et al., 2003, p. 93). More specifically, trust is an expectation that other members of the community will behave in a cooperative and honest way (Fukuyama, 1996), a "willingness to be vulnerable based on the confidence that the other party is benevolent, reliable, competent, honest and open" (Hoy & Tschannen-Moran, 1999, p. 189) and a dynamic process in which parties are involved in a series of interactions which require some risk-taking or faith (Becerra & Gupta, 1999; Tierney, 2006).

Trust is key to the success of several different factors and strategies in 21st century learning systems. It enables stakeholders to take risks, facilitates interactions and cooperation, and reduces the need for control and monitoring (Levi, 1998; see also Van Maele, Forsyth, & Van Houtte, 2014). Trust also offers flexibility to stakeholders to propose and implement innovative changes and reforms. Other factors such as high levels of professionalism and status of the teaching profession depend on it. In addition, in complex systems, trust acts as glue to allow systems to function well and not depend on formal bureaucratically defined relationships (Istance, in communication).

Policy-makers can play an important role in creating conditions which facilitate the emergence of trust. However, the question remains which structures would favour conducive conditions for building trust. Cosner (2009)

provides an example of principals who emphasise teacher interaction and collaboration but complained about insufficient time to actually interact and build collegial trust. These principals then changed structures in order to increase interaction time by, for example, rethinking the daily schedule at school, organising more meetings and introducing a teacher room.

Trust can facilitate innovation because it can reduce uncertainty about opportunistic behaviour. This is important in a high stakes and traditionally risk adverse field like education. Trust increases the feeling that other actors will exercise their goodwill in the joint search for innovation solutions and creates safe spaces for innovative approaches and the exchange of ideas (e.g. Nooteboom, 2010; Parker & Vaidya, 2001; Ring & Van de Ven, 1992). *For example, in schools with high teacher collegial trust, teachers are more oriented towards innovation as they are more willing to try new practices and are more open to change (Bryk & Schneider, 2002).*

School leaders, teachers, parents and students need to view trust as the bridge that reform must be carried over, as educational change is difficult to do in low-trust settings (Hargreaves, 2002; Louis, 2007). The strengthening of a culture of trust in education requires a form of accountability which supports rather than diminishes the professionalism of teachers.

Professionalism

Closely linked to accountability, trust, complexity and innovation is professionalism. How can the teaching profession be a driver of educational innovation? What kind of reforms and governance would be needed to enable this to happen?

The previous section highlighted the importance of professional accountability in trusting teachers by developing teacher professionalism and collaboration (Tschannen-Moran, 2001). Professionalism can be defined as efficiently rendering a specialist service based on a body of knowledge (Morris, 2004). It is about raising the status of the teaching profession and regarding teachers as autonomous professionals with specialist knowledge in their field. Professionalisation as a process is about being delegated sufficient trust to be accorded self-governing status (Morris, 2004). It involves giving the teaching force increasing responsibility for scrutinising and evaluating the practices of its members (Morris, 2004). Teacher professionalism is constantly changing and being redefined (Helsby, 1999), in part due to increased control by governments (Hargreaves, 1994) or changing demands on teachers (OECD, 2013c).

Teachers emerge as one of the key stakeholders in innovation and take on many roles. They can act as leaders in proposing and implementing innovative reforms, as practitioners of internal accountability and as professionals operating in demanding contexts of complexity. They are granted trust to implement innovations because policy-makers and other stakeholders including parents greatly value teachers as professionals. New data from the OECD Teaching and Learning International Study (TALIS) indicate that teachers with more autonomy are more likely to engage in innovative practices (OECD, 2014b). An implication of the professionalisation of teaching is that teachers become responsible for processing and updating their knowledge for professional practice in order to improve teacher quality (Guerrero, forthcoming). Teachers also need to develop new competences in order to help students acquire 21st century skills (e.g. collaboration, problem-solving, communication and creativity), ensure social cohesion and well-being of students, participate in more distributed school leadership and management roles in response to greater decentralisation and school autonomy (OECD, 2013c, p. 279). This is especially key in times of ageing teaching workforce, high attrition rates of new teachers and teacher shortages.

One of the barriers to raising the status of the teaching profession is the lack of an integrated knowledge base (Hiebert, Gallimore, & Stigler, 2002; Shulman, 1986). Having an adequate knowledge⁵ base, be it general tacit knowledge or explicit knowledge such as academic and research evidence, professional and practitioner knowledge, administrative data and statistics (OECD, 2009), is key for the innovative process. Even though knowledge has been an important part of education, it has not necessarily improved education systems. Educational research has not translated directly into practice (OECD, 2004). The research community has not been that successful at providing evidence in forms and formats to be used by the worlds of policy and practice.

Berliner (2008) calls it the 'great disconnect' between research, policy and practice. Research might not always be accessible to teachers and policy-makers, and there is a difference between 'knowing about' and 'implementing' research processes. The abstract and simplified research from educational scientists does not easily cross over to the concrete and complex world of practice. Practitioners often use educational research sparingly because teachers usually teach in their own classrooms and are under little pressure to engage in changes. In addition, changing teacher behaviour based on research findings may add uncertainty to classroom life, whereas teachers like to keep order. Another reason is that the complexity of life in classrooms means that educational research may only be able to provide practitioners rules of thumb and not rules of practices (Berliner, 2008, p. 312). Berliner (2008) suggests that more research about how to make things actually work in the setting we want to improve should be conducted.

There has not been a lot of support for the production and use of research evidence in the classroom, though some exceptions exist such as Finland and Singapore. School leaders should thus encourage the understanding and use of research and also implementing research-based reform. This would allow shared ownership of reform. The move to making teaching a profession needs capacity-building, reform and new governance structures (OECD, 2007, p. 21). It implies a degree of teacher and school autonomy such that teachers could act on the basis of their specialist knowledge to integrate research findings (OECD, 2007, p. 25). In this regard, the profession requires new governance structures where the profession is a major stakeholder in setting the policies that govern their work (Guerriero, forthcoming).

Leadership

What type of leadership do policy-makers need to develop in order to create a culture of innovation? Leadership is an important driver at all levels of innovation and more broadly, it is central to all the themes discussed in this article. Leadership refers to the level of ownership and support given by the leaders who will manage the daily activities of those using the innovation (OECD, 2009, p. 84). It provides vision, sets direction for learning within increasingly complex organisations, and is about seeing that through into design and strategy (OECD, 2013b). Leaders can be teachers, principals, administrators, students, parents or politicians. Leadership is necessary to drive and sustain any (successful) innovative change, and to ensure that learning remains at the centre of innovation.

There are several forms of leadership, ranging from learning, innovation, instructional to organisational. For example, the ILE project highlights learning leadership because learning is the core business of education. It is about fostering and guiding learning change but it is also innovation leadership – promoting, facilitating, organising and managing the innovation endeavour (OECD, 2013b, p. 18).

5. Knowledge is assimilated information and the understanding of how to use it where information is organised data understood in its context and data constitutes the raw bits of information (Hess & Ostrom, 2007, p. 8).

Leadership can happen at different levels, moving from the micro level of schools and learning environments, the meso level of networks and communities of practice to the macro level of systems and policies (OECD, 2013b). At the micro level, school leadership is crucial to improve teaching and learning within each school and to connect the individual school to the outside world (OECD, 2008). It can improve school outcomes by influencing the motivations and capacities of teachers, as well as the school climate and environment. Effective school leadership is essential to ameliorate the efficiency and equity of schooling, as well as for education reform (OECD, 2008). School reform is more likely to be successful if school leaders are actively involved in policy development and formulation.

Besides the micro and meso levels, leadership is needed at the macro (system) level. To overcome barriers to innovation, it is important to have policy strategies which facilitate conducive conditions and climates. Policy leadership can help shaping such conditions and climates so that learning innovation is seen as a mainstream activity (OECD, 2013a). Political leaders (such as ministers and senior officials) can send strong messages about the importance of innovation and help create a culture in which innovators are valued, recognised and rewarded, and where innovation is seen as an important part of everyone's job (OECD, 2009, p. 48). However, strong leadership does not just emerge, it needs to be developed and cultivated. As a result, it is useful to include leadership recruitment and development as part of any improvement strategy (OECD, 2008).

Conclusions

The education system is often considered resistant to innovation due to an inherent conservatism in the profession. However, recent findings indicate that there is as much innovation ongoing as in other public sectors. Therefore, this raises questions for the governance of reform, including what types of accountability, trust, professionalism or leadership can foster a culture of innovation in complex education systems.

This article has highlighted that in contemporary education systems, for instance, horizontal accountability combined with strong professionalism and trust can generate a culture of innovation, especially when supported by strong learning and political leadership. Nonetheless, the context and specific conditions in countries and education systems need to be taken into consideration as there is no one-size-fits-all solution. A great deal depends on how policies are interpreted and implemented in practice.

Governments will continue to be under pressure to innovate their education systems, but if the right governance structures are not in place, the success of implemented policies is unclear. Different governance elements and conditions have to be combined to achieve successful innovative reforms in education. Drawing on existing works, this article has provided one take on what some of these factors might look like. Nonetheless, it remains mostly a theoretical piece and would benefit from empirical examples in future research. Future research should also analyse which governance structures could generate and sustain a culture of innovation in particular contexts and systems.

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