Chapter 4

Drivers, Enablers and Barriers to Systemic Innovation in VET

Introducing change and implementing innovative ideas is difficult, particularly in rather traditional systems such as education. This chapter presents those factors that play a crucial role in triggering and/or facilitating innovation (drivers and enablers), and those that can hinder the successful introduction of these changes (barriers). The chapter draws on the empirical evidence gathered in the case studies and shows the different roles that drivers and barriers can play at different stages of the innovation process. These drivers and barriers are also context specific, with each system required to develop its own successful "recipe" to guarantee adequate response to the needs and barriers it faces. Overall, some of the major barriers identified in the study are: innovation fatigue, competing policy agendas, and accountability mechanisms that radically restrict risk. The chapter closes with a number of policy implications aimed at helping policy makers with the crucial questions they face when promoting systemic innovation in their VET systems: what are the ingredients for successful systemic innovations in VET? How amenable to change are the foundations that create/contribute to barriers?

Introduction

Introducing change and implementing innovative ideas are difficult, particularly in rather traditional systems such as education. In the study of systemic innovation it is crucial that any analysis include a discussion of the factors that could play a role in understanding the need for change in the system, and that could trigger and/or facilitate the implementation of these changes. Likewise, it is imperative to also focus on factors that hinder and/or bar innovation or change within the system.

The drivers and barriers for systemic innovation in VET are multiple and of many different natures. Economic, social, political, technological, and other factors can all work to either drive or hinder innovation. While each driver responds to a major challenge that the VET system faces and is perceived as urgent to resolve, each barrier also represents an important element of the *status quo* that can, if not managed appropriately, delay or derail innovative initiatives.

Understanding and identifying these factors becomes crucial for policy making, as policies can be designed and implemented to foster those factors that nourish an environment conducive to innovation; conversely, measures can also be defined to address those factors hindering the genesis and diffusion of innovations.

Drivers and barriers: a complex interaction

It is difficult to provide a definitive list of key drivers or barriers, as the role a particular factor plays in the innovation process can change as a function of context, and what in some circumstances could be a driver of innovation might in others act as a barrier (see Box 4.1). In addition, it is difficult to isolate particular factors as driving or hindering any specific systemic innovation, as drivers and barriers act within a dynamic and closely interconnected context. Furthermore, the process of systemic innovation involves many stages (as laid out in the model of innovation in Chapter 3), and so barriers/drivers at one stage (*e.g.* development) may or may not play the same role at another stage of the process (*e.g.* implementation, evaluation). To further complicate matters, systemic innovations tend to be complex processes aiming to resolve more than one challenge. Any analysis of the role of drivers and barriers to systemic innovation in VET must therefore take into account these complexities.

Despite this complexity, meaningful analysis can be done on the types, roles, and functions of drivers and barriers within any given context. A first step is to look more closely at what we mean by the terms drivers and barriers, and by extension the roles they play in systemic innovation. ***Drivers*** can be defined as variables that trigger innovation (*e.g.* the decision of a senior

Box 4.1. **Driver or barrier? It depends on the context, or the role of unintended outcomes**

The growing demand for greater accountability in education systems has signaled a rise in outcome and achievement measurements, as well as an increased emphasis on the role of research and evaluation. Research and development is essential to the innovation process, and the monitoring and evaluation of ongoing innovations a central element in our model. Evaluation and monitoring, while not explicit drivers of systemic innovation, comprise an essential component of the process and can be thought of as setting positive preconditions and/or acting as enablers of innovation.

However, despite being an undeniable impetus for innovation and improvement as well as a necessary component in the innovation process, the increasing system-wide emphasis on evaluation and monitoring has also an unintended barrier effect to innovation. Systems that place a high importance on evaluation and monitoring are, by their very nature, highly accountable. Yet greater levels of accountability restrict the level and nature of permissible risk in the system. In highly accountable systems, then, very little room exists for risk-taking, as the possibility of failure is too high. This is an example of an unintended barrier effect of a positive driver/enabler of systemic innovation. Although not a deliberate outcome or strategy, governments and policy makers must monitor this known tension to allow systems to operate at the level of accountability desired, as well as permit the kinds of risk-taking required for impactful innovation to occur.

level policy maker to develop a new programme). These drivers are effective when embedded in ***positive contextual preconditions***, such as a perceived need for change due to a social or economic crisis or issue. An example of this would be the context of strong economic growth and the birth of new technologies that have broad applicability to numerous VET domains. These preconditions would not be sufficient to begin the process in and of themselves, but, as mentioned previously, would aid the driver in effectively triggering the process of innovation. This can also be thought of as the distinction between immediate/direct and distal/indirect causes.

Drivers are distinct from but closely related to ***enablers***, which are factors that aid and support the process once it has been triggered. These would build on the positive preconditions as described above and might include the creation of specific funds for systemic innovation projects in a given VET system. Other variables, such as a social crisis (*e.g.* the riots in the suburbs of Paris and central Athens in 2006 and 2008 respectively), might also act as enablers of change in that they could motivate stakeholders to take action and push them to address elements of the system requiring improvement. Such enablers would be crucial in setting the stage for innovation to occur, but would not necessarily be drivers in and of their own right.

The same conceptual distinction can be made for ***barriers***, factors that impede or block innovation. An example of a barrier could be the election of a new government with a stated goal of reducing the number of apprenticeships or disbanding VET colleges. Such hindrances would be crucial in obstructing the process of systemic innovation in VET, but would not necessarily stop it. Examples of a formal barrier (*e.g.* one that effectively ends the innovation) would be the cancelling of specific funds for systemic innovation projects in a given VET system. These barriers also exist in a set of contextual preconditions. These are generally **negative contextual preconditions** that impede innovation, and could include, for example, the context of poor economic growth but with relatively low unemployment. In such a context the urgency to innovate existing systems is low and suffers from a paucity of funds. These negative preconditions, as already mentioned, would neither aid the process of innovation nor suffice to halt or bar the process.

These arguments and their applicability to the case studies and the VET systems in the countries we studied will be more fully developed in each of the sections below.

In sum, any discussion of drivers and barriers to systemic innovation must acknowledge two things:

- Factors identified as drivers can also, depending on contextual factors and preconditions, act as barriers (and *vice versa*);
- Drivers/barriers play different roles at different stages of the innovation process and can be thought of as direct determining factors that operate within contextual preconditions. These are distinct from enablers, which are influencing, but not determinant, factors.

To allow for an in-depth analysis, this chapter is divided into two parts: *(i)* drivers and *(ii)* barriers. The first half of the chapter will provide an analysis of the drivers in influencing the system. The second half will look specifically at barriers to innovation, from both a system and a process level. The chapter will end with joint conclusions and a set of recommendations based on these analyses.

Drivers to systemic innovation in VET

As explained in the introduction, drivers and enablers are factors that can trigger or facilitate a process of change intended to introduce a positive outcome in the system. Drivers can be defined as those factors that press for innovation, while the enablers are those that help uptake and disseminate these innovations.

The drivers for systemic innovation in VET are multiple and of different natures (*e.g.* economic, social, political, or technological). Each driver responds to a major challenge that the VET system faces and is perceived as urgent. The enablers of systemic innovation are also multiple and different in their natures, and as mentioned earlier, facilitate the adoption of innovations.

However, identifying and distinguishing between drivers and enablers is not always easy in practice. In general, these forces tend to interact and co-evolve in all stages of the innovation; therefore, it is difficult to distinguish which specific factor is affecting what in each stage. In any case, what counts is that they are positive factors for innovation and that policy makers should be aware of their presence or absence in order to facilitate, whenever possible, the overall process of innovation.

The importance and role of the main drivers and enablers of systemic innovation may vary depending on the structural characteristics of the VET and the VET innovation system. Different countries face different challenges, and VET systems are extremely diverse in their natures and the roles they play. As one could therefore expect, the driving forces behind the adoption and implementation of innovations would also vary.

This section aims to provide a more detailed and nuanced picture of these factors, based on the empirical evidence gathered during the country visits of this project.

Economic factors

The push for globalisation requires that countries compete in a context of decreasing trade barriers and constant improvement in technologies, methods of transportation, and communication. Innovation and competitive markets are increasingly regarded as the engines for economic growth, and this induces dramatic and increasingly rapid changes in the economic structure of a given country as new economic activities rise and others are abandoned or severely restructured. As a result, nations, institutions, and enterprises require a new and dynamic pool of skills that can respond to their productive needs. For example, skills related to innovation, knowledge management, or specific economic sectors – such as ICT – and a greater adaptability/flexibility/permeability of both workers and labour market are required. Globalisation and innovation, and the resulting changes in economic conditions, are thus generally considered to comprise a main *driver* of innovation.

The empirical evidence of this study suggests that most innovation initiatives undertaken by governments have aimed to respond to the economic challenge of adjusting training supplies to the economic needs of a new productive structure. This adjustment could involve the upgrading of particular sector-specific knowledge and skills, such as the *Mayan Riviera* case

(Mexico) for the hospitality sector; core transversal skills, such as managerial skills in the reform of *Basic Commercial Training* (Switzerland); or the system as a whole, as in the *Globalisation Council* (Denmark).

In addition to globalisation, times of economic crisis can also provide a "window of opportunity" to push for systemic change in VET as the economic restructuring processes may be accelerated. The present report is based on innovations that were adopted in the context of expanding economies. In further research, it could be interesting to compare and contrast these finding with the type of systemic innovations and processes that may emerge in times of economic downturn.

Social factors

VET is considered to be a tool for improving social equity and inclusion in most OECD countries. This is due to a number of reasons: first, it provides a natural transition between school and the workplace, and plays a crucial role in integrating young people into the labour market. In addition, VET is often regarded as a tool for retaining students at risk – those who are socially, economically, or academically disadvantaged – and providing them with sufficient qualifications to access the labour market. In numerous systems, it also offers opportunities to rejoin the traditional schooling stream or choose to pursue higher education later on. This belief in inclusion is strongly rooted in many OECD countries, and the need to provide better-targeted programmes or introduce complementary services aimed at this target group of students has been a main driver for many of the systemic innovations in this project.

More precisely, *Step One Forward* (Hungary) is aimed at helping unskilled and poorly skilled workers acquire more "marketable" qualifications and improve their chances of obtaining better-paid jobs. A similar rationale has been the underlying driver of the *VPET Case Management* (Switzerland) that targets young people at risk of becoming unemployed. The empirical work has also revealed that in the cases of the *Innovation Circle* (Germany) or The Reform of *Technical Baccalaureate* (Mexico), the main driver was not only to assist students in a difficult situation but to enhance the permeability of students across systems, either horizontally (*i.e.* between different VET streams) or vertically (*i.e.* from VET to higher education). These initiatives were driven by the need to avoid study lock-ins and potential dropouts and enhance the opportunities for students to continue their studies and access potentially better-remunerated jobs.

As in the previous case, the current economic crisis may put new pressure on VET systems to relocate all those who may find themselves out of the labour market and whose skills may not be fit for the changed economic conditions that could emerge after the crisis.

Technological factors

New technologies, especially the use of ICT, can provide new ways of teaching and learning and thus improve both student satisfaction and student achievement. In VET studies that involve costly training and extensive practice (*e.g.* welding, using heavy machinery, etc.), virtual training modules have been used to improve the preparation of students in both technical skills and safety procedures before they reach the shop floor. This helps both the employer, who receives better-prepared apprentices, and the trainer, as it reduces time spent overseeing individual students. Students also report positive perceptions of this kind of training. In addition, new technologies can facilitate communication between stakeholders and therefore enhance the satisfaction of different stakeholders with the VET system. The use of new technologies, and especially ICTs, is thus considered a consistent *driver* of systemic innovation in both the design and delivery of VET.

The case of the *Mayan Riviera* (Mexico), in which new ICT and mobile sets have enabled the reaching out to a wider public, is an example of how technology facilitates new and better services. Without the technology made available, these students could not have had access to specific training courses; thus, their ability to access the labour market could have been jeopardised. In Australia, ICT and the development of e-learning infrastructures have also provided an opportunity to bring all the governmental stakeholders in the VET system together to work on a national plan and to set standards for a flexible learning framework.

Political factors

Systemic change in education in general, and in VET in particular, may often require a strong top-down political push to overcome many of the barriers that hinder the adoption and diffusion of change. These barriers will be discussed in detail in the next section of this chapter.

Public institutions and policy makers can play a crucial role in initiating and steering the adoption of innovations in VET systems through funding, legislation, and leadership. Depending on the country and geographical context, the political field may include the regional, national, and/or international (*e.g.* European) spheres.

The empirical evidence gathered in the context of this study provides many examples of the different roles that public institutions and politicians have played in initiating the innovation process. Just to mention a few examples, strong political leadership and will to bring the various stakeholders together were key to the creation of the *Innovation Circle* (Germany), the *Globalisation Council* (Denmark), and the *Reform of the Technical Baccalaureate* (Mexico). Moreover, political legislation and funding from the

European Union drove the systemic changes initiated in Hungary with the creation of a National Vocational Qualifications Registry.

In addition, political leadership and funding can be highly instrumental in bottom-up innovations. When innovation is initiated by an actor other that the public sector, the public sector can play an important role in enabling the environment that allows these innovations to flourish by bringing stakeholders together, providing funding, or merely eliminating potential legislative barriers that could hinder the implementation of the innovation. This enabling capacity is particularly true when the innovation aims at being scaled-up to other areas of the system. The Mexican example of the *Mayan Riviera* provides an excellent example of not only how government, both at Federal and State level, capitalises on an initiative started in the private sector but also the crucial role public authorities play when a similar experience is intended to be replicated in other sectors of the economy or other geographical areas.

An important factor in the analysis of the role of political context in innovation is timing. All countries go through cycles of political stability, which provide greater or smaller opportunities for implementing change and supporting innovation. Countries that have had shorter periods of political stability (*e.g.* Hungary, whose transition in the early 1990s from a communist to market economy means that the current *status quo* has been in operation for a relatively short length of time, compared to most OECD countries) have in fact an opportunity to develop and implement reforms and innovations relatively quickly. These innovations can also more easily be radical in nature, as systems in political flux provide an opportunity for fundamental change. In countries with long cycles of political stability (*e.g.* Switzerland, Denmark, Germany), the role of the constitution and regulatory framework is paramount, and while there is room for change and innovation, such change is much more likely to be incremental. In addition, stability can be, and is, a driver of innovation – but the change is all too often slow. Of course, even in countries with longer periods of political stability but recent changes in government (*e.g.* Australia), the arrival of a new government is a natural window of opportunity to effect change.

Research evidence

Research evidence of better or improved teaching, learning, or training processes, or of the provision of new services in VET, can be regarded as a supporting element that informs and enables the innovation process. Research evidence can contribute to the design of the innovation process, the identification of potential barriers during the implementation, and the elimination of resistance to change among stakeholders through the use of evidence on the benefits that the examined change may bring about.

There are few examples on the role of research triggering innovation in our case studies, and the SKOLA project in Germany is one of those. Box 4.2 presents the main characteristics and the role of research as a trigger for innovation.

Box 4.2. **Research enabled innovation: the SKOLA/Segel BS project**

The Segel-BS project is part of a pilot programme called SKOLA, which is run by the Bund-Länder Commission for Educational Planning and Research Promotion (BLK), supported by the Federal Ministry of Education and Research, and counts on the participation of 12 *Länder*. The programme aims at further developing, testing, and evaluating the didactic concepts for the promotion of self-regulated and co-operative learning, using modern information and telecommunication technologies. In doing so, it contributes to the development of practice-oriented solutions for establishing a modern learning culture and organisation as well as strengthening self-regulated and co-operative learning.

The SKOLA programme has been initiated by researchers at the Universities of St. Gallen and Dortmund, who convinced the Länder authorities to undertake the initiative and to select the necessary schools to participate. It was informed by the relevant academic research and literature of self-regulated learning on education and educational psychology, which emphasised the benefits of those students learning in self-regulated systems: familiarity and know-how to use a series of cognitive strategies, which help them to organise, elaborate, and recover information; know-how to plan, control, and direct their mental processes towards the achievement of goals; enhanced motivational beliefs and adaptive emotions; improved capacity to plan and control time and effort; and higher capability to maintain concentration.

The role of academic research and academic evidence was crucial in persuading the different stakeholders to participate in the innovation, and instrumental in its design and implementation, as it provided the content material for the design of the training programme as well as the necessary measures to be adopted (*e.g.* communication with VET trainers) for a smooth implementation that would ultimately minimise the resistance to change among stakeholders.

Consensus among stakeholders on the need to innovate and on the innovation

Based on the challenges that a VET system may face, either economic or social, an overall consensus on the need to try new recipes may arise, thereby perhaps facilitating the decision to innovate. This was the case in Mexico, where the severe challenges and the shared perception of the inability of the VET system to face these challenges facilitated the decision to initiate innovations deep in both the nature and scope of the changes envisaged.

Moreover, consensus on the procedures and timings to carry on the innovation can also become a crucial enabler for smooth implementation. The existence of consensus can make implementation much easier, and eliminate or reduce potential resistance from stakeholders. Most of the analysed innovations showed the great value of stakeholder consensus as well as the problems of not counting on this consensus in numerous VET systems. For example, the *Innovation Circle* (Germany) showed how stakeholders agreed to implement the initiative based on shorter-than-usual times to facilitate the momentum for innovation. This initial consensus on the procedure facilitated implementation and avoided stakeholder resistance to the project.

Finally, when consensus is necessary to adopt and implement an innovation, a lack of agreement may affect the potential and capacity of the system to introduce significant and far-reaching innovations. This will be explored more fully in the next section of this chapter.

Innovation support institutions

Innovation in VET is a complex process, and one in which many stakeholders need to get involved and count on the necessary information and knowledge to achieve a successful outcome. At times, the interactions between the different stakeholders involved with innovations are not as strong as would be desirable, and sometimes the stakeholders may not rely on the necessary knowledge that would allow them to make an informed decision. Historical, geographical, or sociological factors may be responsible for this lack of connectivity, and at times the existence or creation of institutions such as partnerships, networks, institutional champions, and knowledge brokering organisations can help bridge this gap.

The empirical research in this project has shown both that innovation support institutions, such as knowledge brokerages, are not abundant in the VET system and that some countries have aimed to address this deficiency by creating or strengthening this type of enabling institution. Box 4.3 presents two initiatives of recently created innovation support institutions in Australia and Switzerland.

Financial resources

The availability of financial resources can act as an enabler for change at all stages of the innovation, from the moment of making the decision to the implementation of innovation, thereby eliminating potential barriers the foreseen change may encounter.

Although not necessarily a driver in itself (*i.e.* the availability of funding may not be the main reason to initiate an innovation), financial resources can be a catalyst to initiate the innovative process and to buy in stakeholders.

Box 4.3. **Innovation support institutions – Australia and Switzerland**

Australia has created a number of innovation enabler institutions to help create, maintain, or foster institutional breadth, and thereby allow for the generation and diffusion of innovations in the system. Some examples of these institutions are: *(1)* the Local Learning Employer Network of the State of Victoria, which linked the worlds of work, education, and training by exposing young people to occupations they would most likely never have thought of; *(2)* a group of training organisations that were felt to encourage the growth and sustainability of apprenticeships in the key trades, particularly in small and medium-sized enterprises; and *(3)* the Australian Technical Colleges, which were innovative institutions to increase the outreach and delivery of VET.

The creation of these institutions requires a well thought-out plan regarding their role in the system as well as the instruments, activities, and resources they would need to fulfill these tasks. Short-term tasks, insufficient funding, and lack of integration in a coherent innovation strategy may result in a lack of substantial impact, leading to potential innovation fatigue (see section below on barriers).

In Switzerland, the *Leading Houses* represent a unique and innovative approach to coordinating, at a national level, research efforts on VET and making them responsive to the country's needs and priorities in this domain. They are designated centres of expertise located in universities whose main mission is to build a competence network to conduct research on their own account, grant research contracts, and promote young research talent, while simultaneously maintaining strong international connections.

Examples of this are two Hungarian case studies in which the availability of funding from the European Union allowed the national public authorities to continue with the project.

Moreover, the availability of funds may be a precondition for implementing the different dimensions of the innovation, as systemic innovations may require new, broad, and financial-intensive changes. The lack of these resources, as will be presented in the next section of this chapter, could constitute a strong barrier that could hinder a successful implementation of any innovation.

Capacity for innovation

Innovation is a complex process that requires a deep understanding of the system, stakeholders' involvement, requirements both in terms of dynamic changes and financial implications, and foreseen objectives and activities. The capacity to understand, manage, and steer this process is crucial, and is certainly an enabler of innovation. Perhaps, one could say that more than an enabler, as previously argued for financial resources, it is a necessary prerequisite for any successful innovation.

This innovation capacity must be present at all levels of the innovations and throughout all of the different stages. At different stages of the innovation, different actors may take the leading role of pushing the innovation forward. All these actors need to have the vision, attitudes and managerial capacity to innovate.

However, the capacity to innovate cannot always be taught. While management can be learnt through formal training, the capacity to innovate is believed to be a "learning by doing" process, in which the involved stakeholders in VET, including politicians, need to acquire specific competences and attitudes. In many cases, these competences, and mainly the attitudes, are the result of cumulative innovative processes that have generated an innovative culture embedded in the specific systems. As a result, some systems may benefit from stronger embedded innovative capacity than others. Given that it is a necessary prerequisite for successful innovation, the lack of this capacity constitutes a serious barrier for successful innovation.

Barriers to systemic innovation in VET

As outlined in the introduction, drivers and barriers to systemic innovation in VET operate within contextual preconditions that either encourage or hinder particular innovations at particular times. In our analysis of case studies, it became clear that a factor considered a driver or enabler of systemic innovation in some contexts could actually have the unintended opposite effect in others. Although systemic change operates in such a fluid policy and practical context that it is impossible to foresee all eventualities, it is crucial to consider both direct and possible indirect outcomes of initiatives to minimise the development of unintended barriers (see Box 4.4).

As set out in the section entitled "Drivers to systemic innovation in VET" of this chapter, the major basic categories of barriers can be considered to fall under the following headings: economic, social, technological, and political. The following discussion is based on our typology and analysis of case studies, and looks at both clear and consistent barriers and the (more frequently observed) barriers that were unexpected results of well-intentioned initiatives. The barriers identified are thus VET-specific, but many are also transferable to education systems as a whole.

Economic factors

There are a number of different barriers to systemic innovation in VET that stem from economic sources. These include the obvious and most common barrier to systemic innovation in VET: cost. They also include the current push to link innovation in VET to labour market demands and mid-term skills forecasting, as well as the unexpected result of addressing short

and medium term requirements at the expense of long-term vision. Each of these factors will be more fully developed in turn.

Systemic innovations cost money, whether they are products, processes, or ways of organising the delivery of services. There are the direct costs of designing, developing, and implementing a particular innovation; of training the practitioners; and of new technology. There are the (often skipped) costs of evaluating the innovation and feeding that information back into the system to improve the functioning and quality of the innovation. Finally, there are also the indirect costs of change, including how constituencies with vested interests (which in this case would range from social partners in the education system to the private partners representing the labour market and employers) create costs when required to change their ways of operating.

However, even when funds are available and set aside to support innovation in the system, they can have unintended effects that are directly the opposite of what was initially intended. Box 4.4 provides a closer look at how one particular source of funds, specifically aimed at promoting development and innovation, had in fact an unintended barrier effect.

Box 4.4. **Hungary and the role of European funding**

It was very characteristic in the present Hungarian context that both case studies were EU projects (European Structural Funds and European Social Funds). EU funds act as a main driver of innovation and change in Hungarian VET and are essential to the innovation process. However, the highly centralised and competitive nature of the funding process also inadvertently imposes barriers to the process by:

1. Supporting a top-down approach to innovation. This has ramifications for the origins and dynamism of systemic innovation in the Hungarian VET system, as well as for the degree of openness in the system to bottom-up or grassroots initiatives.
2. Adding a heavy administrative burden and timelines. Given the tight deadlines imposed by the EU project schedule and the delay in beginning the case studies on the part of the Hungarian authorities, there was not enough time to conduct pilot projects and gather research evidence that would underpin policies and project development. For both of the case studies, this harmed the quality of implementation and the ability of the system to learn from both pilot results and final outcomes.
3. Restricting sustainability. EU funded projects come with a built-in timeline and end date. Although intended to avoid non-delivery of promised outcomes, continuously new projects can have the unintended effect of hindering the development of previous reforms and innovations. This has implications for long-term planning and strategizing as well as for the use of evaluation and research results, and carries with it the danger of "innovation fatigue" from the population and user groups.

Short-term innovation at the expense of long-term vision

There is a risk, particularly in times of economic crisis, to prioritise short-term needs over long-term innovation and strategy. In the years leading up to the country visits, there was a push across all countries studied to bring the VET system more into line with the requirements of the labour market and make it more responsive to labour market needs. Tighter links to labour market needs and skills remove the focus from education, and place it instead on skills needs, industry demand, and the current technology framework. As discussed in the previous section on drivers, this was a driver/enabler for many of the case studies in this project (*e.g.* in Australia, Hungary, Mexico, and Switzerland) and was a response to the criticism that the VET system had become too entrenched in educational needs and structures and was becoming out of touch with employers. However, even though the short and medium-term strengths of the system have allowed it to innovate and shape itself in response to market changes, they are also limitations.

An example of this has been that basing innovation on current conditions and skill requirements does not permit the system to explore truly innovative projects (*e.g.* emerging technologies and job areas/skill sets). If the system is driven primarily by industry needs, the need to take risks and think outside the box (including introducing funding levers for these activities) is obscured. This leaves little room for long-term projections or strategic visions for systemic innovation in VET, and little room to try and foresee emerging skill sets and jobs in real time. It also leaves little room for user-side orientation, which has also been identified as key to identifying bottom-up innovations and emerging skills. Overall, this is not a major barrier, as certainly the bulk of system orientation should consist of the demands of the labour market. However, an overzealous focus on skills forecasting (which has been criticised in its own right) comes at the expense of capturing the emerging, non-predictable skill sets and occupations that are a necessary part of systemic innovation. Chapter 8 explores how the use of other sources of evidence, including blue sky research from academics and emerging innovations coming from the field, can be used to augment the traditional sources of information for labour market needs and expected progression.

In addition to strategic choices for funding and curriculum focus, the current pressure for more skills in the labour market has initiated ongoing debates about how and in which ways VET programmes may be accelerated or shortened to have a quicker transition to the workplace. One obvious way to do this is to include the recognition of informal and non-formal learning as a system feature across different forms of VET provision, as a means of programme acceleration. The risk of shortening programme structures is that resulting qualifications may suffice for immediate labour market needs but

may not ensure sufficient transferable skills for medium-term employability and mobility. This, then, is another example of how a short-term enabler of innovation could result in a longer-term barrier to the strength and adaptability of VET systems. Across dual systems in the OECD countries there exist numerous examples of how systems are trying to bring in greater flexibility without sacrificing the general applicability of the skills learnt by the individual.

Social factors

There are a number of different barriers that fall under the general heading of social barriers to systemic innovation in VET. These include issues related to demographics, such as the aging of the VET workforce and the changing landscape of students in OECD countries. They also include lack of attention to implementation issues, including generating consensus among stakeholders and capacity building in individuals as well as the system. Each of these will be discussed in turn.

Challenging demographics

A key social barrier to systemic innovation in VET is the rapidly ageing workforce of trainers, as well as the current fragmentation of requirements and working conditions for trainers. A lack of skilled trainers and new training recruits is a serious problem both for quality provision and the overall status of VET in many of the countries studied (Australia, Hungary, and Mexico). Given the fundamental importance of VET teachers and trainers for the economies of all countries studied, attracting skilled and competent individuals – especially trainers with backgrounds in a relevant industry as well as traditional education – to the field, raising pedagogical standards, and ensuring relevant and up-to-date occupational knowledge and skills are all vital. However, the demographics of an ageing population and a generally low interest in teaching as an occupation in most OECD countries increase the difficultly of the task. For those countries where VET is seen as a low-status option (Australia, Hungary, Mexico), the situation is even more crucial, as a cycle is created in which low-status systems become less attractive to qualified staff, especially those from industries with a number of other options, and the lack of qualified staff feeds into the perception that the system is weak.

By virtue of its focus on social inclusion, VET has come to be seen in some countries as an option for those less skilled, less bright, and/or less advantaged. This has translated in many OECD countries to a status problem for the VET system, where it is perceived as a second (or third) best option for education, and thus has problems attracting and retaining high quality

students and teachers.* This status problem is then susceptible to a vicious circle in which the system's perceived failings turn into actual failings, as the quality of the education received drops as a function of the falling quality of staff and students. Low quality (perceived or real) can translate into low support for systemic innovation in VET from the government and also an unwillingness of firms/employers, a major source of innovation in the system, to engage with the VET system. This, in fact, is one of the key themes addressed by one of Australia's case studies (*ATCs and the Status of VET*).

Lack of clarity and capacity building stakeholders

A barrier to the implementation of systemic innovation is the **lack of clarity of the roles** of the various players. In many of the case studies, we observed that knowledge and uptake of the initiative in daily practice and policy orientation were not at the level that could be hoped for among all relevant actors. One clear cause is that guidelines for implementation are often too general and broad in content to allow for obvious and direct action plans on the ground by practitioners either at schools or in companies. In the *Innovation Circle* (Germany), for example, the development of a communication plan and a common methodology to allow for the identification, documentation, and dissemination of promising practices was a key recommendation of the report. In other case studies, deliberate strategies to communicate new roles and expectations were part of the development of the innovation, though not always successful (*e.g. NVQR* in Hungary, *Case Management* in Switzerland).

Another barrier to the successful implementation of systemic innovation is the **lack of capacity building,** or training, for those stakeholders expected to play new roles. In *Step One Forward* (Hungary), the programme necessitated the creation of mentors charged with acting as bridges between participants, local authorities, employers, and the regional training centre. However, despite planned capacity building measures (training on practical issues, regular meetings to share experiences), the rolling out of those programmes was delayed or missing in the actual implementation. A number of other examples from other case studies (*e.g. Case Management* [Switzerland]) make it clear that these small but important steps in implementing systemic innovation can easily be missed. In many cases, the lack of a pilot project (*e.g. Reform of the Technical Baccalaureate* [Mexico], *Innovation Circle* [Germany], *Globalisation Council* [Denmark]) meant that aspects were overlooked that could easily have been

*It should be noted, however, that in countries with a dual system of VET (e.g. Denmark, Germany, and Switzerland) the status of VET remains high and is unlikely to suffer from being associated with social inclusion initiatives.

corrected before full-scale rollout. The importance of pilot projects will be discussed further in Chapter 5.

These barriers take time to correct or avoid, and time is scarce if the process and needs of systemic innovation are not well understood. In VET in particular, the additional complexity of cooperation between public and private sectors adds to the time needed and enhances the need to create an atmosphere of trust. What to include and exclude from final documents of working processes, for example, is not always as transparent as could be, and can quickly generate tensions (*Innovation Circle*, Germany).

Resistance to change/innovation fatigue

Related to a lack of consensus of stakeholders but deserving of their own heading, **resistance to change** and innovation fatigue are also important barriers to systemic innovation in VET. Although resistance to change is a natural human trait, it is also one that can be avoided through targeted implementation and well-conceived incentives and encouragements. However, there is also a danger within highly stable systems that positions become entrenched and stakeholders start to resist change as a reflexive action rather than as a reasoned (and changeable) reaction. In Denmark, for example, there was a tension between the skill needs in new, emerging business areas and the stability needs of the "traditional" labour market. This tension, in fact, was described as a "battlefield" by one of the people interviewed. In fact, the *Globalisation Council* illustrated that a strong adherence to existing structures of the labour market was an obstacle in the Danish VET system, and it recommended that traditional business areas renew their business models, technologies, and processes. It also identified a need for dialogue between existing and new trade boards.

Innovation fatigue is also a natural human reaction. It is a clear and present danger in systems that do not sustain and build on innovations but rather replace one "flavour of the month" with the next. The swift succession of constantly renewed programmes is a common result of funding mechanisms that require an element of "novelty" in programmes for successful funding, It is also a common result of changes in government or political party that seek to make their unique mark within the policy sphere. It is a strong barrier to systemic innovation in that the temptation in individuals and systems experiencing innovation fatigue is to do nothing and wait, secure in the "knowledge" that sooner or later another new initiative will come along to replace the current one. In this scenario, the changes and impact of the innovation are never seen where they matter (in the classroom, at the level of impact) because they are rarely initiated. In systems that have frequent new initiatives coupled with a lack of evaluation of previous programmes, there

is virtually no incentive for a teacher (or student or employer) to start the process of change, as they know they will never be held accountable for it.

The good news is that innovation fatigue is easy to avoid. A sustainable innovation policy should be based on the evaluation of the outcomes as well as on the impact of earlier projects or programmes. New innovations should also be introduced based on solid research evidence and outcome measures, as they are necessary for sustainable development with a certain degree of quality assurance. Without integrating a dimension of sustainability, the risk of innovation fatigue increases in line with the number of new projects. Of course, there is often a tension inherent in the system in that funding is often reserved for "new" ideas and projects, with successful long-running projects losing funding opportunities because they are not perceived as innovative. In this sense, innovation can be forced to some extent because tight competition for limited funding inherently demands innovation. Although innovation can play a positive role in ensuring dynamism and change in the system, it must be carefully balanced to avoid falling into the trap of innovation purely for its own sake. The importance of balanced programme design and the use of research will be discussed more thoroughly in the following section, as well as in Chapter 6.

Political factors

A lack of funds, supportive legislation, political leadership, and willingness to champion systemic innovation are each a major barrier to the innovation process. Even the most compelling social or economic imperatives require the appropriate political context, timing, and willingness for change to occur.

Political barriers to systemic innovation in VET include issues related to governance, such as the complexity stemming from a multi-leveled system of government. This complexity can result in a lack of communication and knowledge-transfer across mandates, and can produce duplicate efforts (and thus expenditures). Political barriers also include traditions for implementing reform agendas, competing policy agendas, and the role played by timing.

Governance

In education, governance is a serious issue, and there exists a continuing trend toward autonomy and devolution. Four of the countries in our project were federal countries (Australia, Germany, Mexico, and Switzerland) in which the governance of education in general, and VET in particular, was relatively intricate. Interestingly, VET, linked as it is to both education and labour markets, often sits in a particular position in relation to governance arrangements. In Switzerland, for example, VET was the one area of education for which the federal government was responsible. Similarly in Australia, VET was one of the few areas in education over which the federal

government had some mandate. In Germany, college training and related factors are the responsibility of the Länder, while company training remains a federal responsibility. This, then, was often perceived as an opportunity to effect change on a national level for both Australia and Switzerland.

However, there were also direct barriers as a result of these governance arrangements. Divided responsibilities in federal countries can create additional difficulties when it comes to initiating and implementing innovation, in terms of a **lack of communication and knowledge transfer** across mandates. Specifically, small-scale innovative projects dealing with issues of concern to the whole system, such as permeability or transition, are often initiated on the ground, sometimes in individual schools and sometimes in groups of schools within a region. However, it is not always possible to identify such projects or to evaluate them systematically and share the findings on a larger scale. In Germany, the *SKOLA* programme, despite being coordinated centrally by the relevant Land Ministry, is an example of how a lack of a suitable coordinating body between the participating Länder and the Federal Government may result in the inadequate use of the findings of these programmes. The cancellation of the Bund-Länder Commission for Educational Planning and Research Promotion (BLK) reduced the potential exploitation of the results within a national policy.

Although not necessarily as pronounced, this potential barrier was also witnessed in other countries. There was a general weakness in knowledge management and transfer across regions and governance systems, exacerbated by practical details such as the sheer size and distance between jurisdictions. In Australia, for example, one main source of knowledge-transfer identified in the interviews was the movement of an individual from a post in one state to another, thereby carrying along his/her knowledge. This is clearly not an optimal strategy for systemic knowledge mobilization. It should be noted, however, that this is not an issue restricted to countries with federal systems of governance: knowledge transfer and mobilization across nations is also general weakness in OECD countries (EbPR OECD, 2007). This difficulty is attenuated in countries with small populations and compact geographical areas (*e.g.* Switzerland and Denmark), principally because, as we heard numerous times, "everyone just talks to each other." This, however, is clearly not a model that will work for the majority of OECD countries. This is a pity not just because it represents an inefficient use of funds and knowledge; localised pockets of innovation, such as projects at a school or community level, though of high value to the immediate participants, are likely to have little impact on overall system change without broader dissemination.

Although both Australia and Switzerland have a national coordinating and planning body for the development of VET, it is up to each region (state, canton) to decide whether to launch particular initiatives or implement the

results piloted in other regions. This individual approach makes it difficult to create a vision for system-wide innovation in VET. It can also lead to the **duplication of efforts** and inherent further expenses, because without an overall strategy regarding the content and effect of innovative measures there exists a risk of substantial overlap among numerous distinct initiatives. Given the autonomy of individual regions in VET systems within the federal countries studied, the topic is difficult to address comprehensively. The various coordinating bodies in Australia, Germany, Mexico, and Switzerland are, of course, working to resolve this issue, but the process is challenging and difficult.

Traditions for implementing reform agendas

There exist a number of political factors that traditionally form a part of implementing reform agendas and that can act as barriers to the process of systemic innovation. One is the reality of **competing policy agendas,** and the constraints that these impose regarding which initiatives get supported and carried out. In this respect, VET finds itself in a particularly complicated policy environment, sitting as it does between Education and Labour Ministries (depending on the country, and sometimes depending on the programme), the public and private sectors, and a vertical series of governance arrangements (school, region, federation, and nation – again depending on the country). The large number of different players yields a high chance of running into competing policy agendas, requiring VET innovations to present thoroughly convincing arguments to win out. An additional barrier to innovation in the system is the conceptual separation of VET from the world of work in certain countries (*e.g.* Australia), at least in the eye of the broader public. This conceptual distinction has concrete practical implications in that if VET providers, policy makers, and practitioners do not link to broader technology and economic policies, they risk being sidelined as a special "education" group (particularly in countries where VET has a low status), rather than perceived as an integral part of economic and labour market development.

A key to placing an innovation on the policy agenda is the ability to develop a sense of urgency about the need for change. This is sometimes difficult in VET for two main reasons: 1) getting VET on the agenda is a difficult process in countries where it is perceived as low status; and 2) proactive innovation requires long-term vision and strategy, and it is notoriously difficult to develop a sense of urgency about long-term agendas. These issues will be developed further in Chapter 8. Box 4.5 takes a closer look at one such situation, as well as the strategy that was developed to deal with it.

Another political factor that can act as a barrier to the process of systemic innovation is the *timing* of the political process. Specifically, the short policy cycle from idea to implementation required by accountability and competitiveness is likely to impede both the use of pilots from which to learn and the

use of evaluation as a measure for policy learning and evidence-based policy making. The *ATC programme* (Australia) and *Step One Forward* (Hungary) are examples of projects that had either their pilot phases or evaluation phases cut due to timing pressures. Alternatively, the evaluations may not be cut, but decisions about the future of a programme are likely to be taken before any system evaluation has occurred. Successful innovation cycles involve the constant use of feedback from monitoring and evaluation to shape the development of new projects – in short, there will always exist a need to learn from what has already been tried. To cut the feedback loop or omit the evaluation step is to potentially miss useful lessons on how best to further develop the system.

As mentioned above, cutting the feedback loop is not only an example of poor use of monitoring in policy decisions, but also linked to the risk of innovation fatigue. In a context in which innovation development and implementation decisions are perceived as potentially political, and in which doing a good job or successfully reaching targets is not necessarily translated into renewed funding or support, there is a grave risk of stakeholders of all levels

Box 4.5. **Germany and the Innovation Circle**

In Germany, the design of the Innovation Circle showed a certain amount of political courage by making a clear break with traditions of policy making that had typically grown out of public pressures to solve problems of immediate concern. From the point of view of voters, topics that are not of immediate concern may often gain little attention in the public discourse (with the possible exceptions of environment and climate). In the design of the Innovation Circle, the Minister and the ministerial officials had to struggle to evoke a sense of urgency on future oriented topics, for which current decisions could affect the relevance and the efficiency of the German VET system of tomorrow.

From the outset, the Innovation Circle was an innovative approach to policy making in that it opened a dialogue on plausible future developments in Germany with systemic impact on the VET system, but risky insofar that consensus on coming transformational change in the German VET system would strongly depend on the extent to which a sense of future urgency could be conjured and shared among all participants at an early stage in the dialogue. With hindsight and the evidence provided, several complex topics were brought into an open discourse for the first time, such as the topic of modularisation and transfer, but no consensus was reached during the Innovation Circle process.

The Federal Government subsequently launched a five-year funding programme that offers a window of opportunity for targeting funding strategically with a medium to long-term orientation. This new round of funding measures could be a means of inducing systemic innovation as well as for sharing and disseminating both successes and failures. This will call for clear evaluation guidelines and policy co-ordination between the federal and *Länder* level representatives beyond the current structures of governance.

losing their incentives or eagerness to be leaders of innovation. The tension between the timing of the policy cycle and the timing of a research cycle is one of the fundamental challenges for the use of evidence in policy making (OECD, 2007) and will be discussed further in Chapter 6.

A last element, which traditionally forms a part of implementing reform agendas and can act as barriers to the process, is the **lack of a leader,** or champion, of the innovation. As argued in the "drivers" section of this chapter, an individual, or set of individuals, ready to champion the cause is a key driver and a frequently the main reason given innovations reach the policy agenda. Conversely, the lack of such an individual, or set of individuals, acts as a barrier to innovation. Alternatively, if those leaders do not receive the support they need or are not in a position to make changes (*e.g.* senior policy maker or programme designer, senior management in charge of implementing an innovation, etc.), then the leadership displayed will not be capitalised upon. Thus, it is vital that systems contain mechanisms to allow good ideas to percolate up through the system to those in a position to make change happen.

Lack of stakeholder consensus

Failure to generate consensus among stakeholders acts as a barrier to systemic innovation in VET in numerous ways, though most markedly in the implementation phase. In Denmark and Germany, for example, the system is based on the consensus principle, which holds that all stakeholders, including the social partners, need to reach a common agreement when changes in policies are introduced. This is certainly a virtue of the system. However, it can also act as a barrier to radical systemic innovations (*i.e.* major changes to the ways services are provided involving and affecting several aspects of the system). The *Innovation Circle* (Germany) is an example of how an intended radical innovation failed to take place, despite effort to involve participants in a personal capacity, so as to minimise the effect that ideology and stakeholder interests play in the process.

Of course, the inclusion or exclusion of stakeholders from part of the process of innovation (*e.g.* initiation and development) is often deliberate. An element of top-down innovation is that choices are made regarding whom to include and when to include them in order to speed up the process or promote change likely to be resisted by certain groups. For example, deciding to prioritise one interest group over another to achieve a strategic goal is relatively common – see the development of *Apprenticeships* (Switzerland) and the initial development of *NVQR* (Hungary) for examples of deliberate prioritising of labour market needs over educational needs, and the creation of *NCVER* (Australia) and the *Leading Houses* (Switzerland) for the prioritisation of policy needs over the views of researchers in the field. However, such choices

must be calculated carefully with the knowledge that innovations without initial buy-in from all stakeholders can result in a **lack of ownership** and thus lead to resistance during the implementation process (see also Chapter 6). In cases such as these, it is important to think through the various incentives that can be offered to encourage compliance and reduce resistance from particular stakeholder groups, particularly if the resistance can be foreseen to some extent as a consequence of inclusion/exclusion choices made earlier in the process.

Accountability mechanisms that radically restrict risk

Throughout the last decade, there has been a push for greater accountability in educational systems in general, and a corresponding shift in focus from the inputs to the outputs of the process (*e.g.* student achievement). This rise in accountability has had a corresponding decrease in the level of risk tolerated by the system, and thus the type and nature of systemic innovations that are supported. Risk, with its implied chance of failure, is difficult to support in a policy climate that does not tolerate mistakes. VET, with its particular ties to the private sector, is an interesting example of how this plays out in a broader political environment.

The market competitiveness agenda (including competition between regions or states) that has characterised reforms in the VET sector for the last decade or so has been accompanied by a strong culture of accountability. However, this focus on accountability leaves little room for either risk-taking or failure. In the literature on systemic innovation, risk-taking is identified as a crucial factor in driving breakthrough innovations. Although there were some examples of support for riskier ventures in the case studies we observed, (*e.g.* the open category of funding for blue skies research at *NCVER* [Australia]), these were very much exceptions to a carefully audited and accountable system.

This, then, is a serious barrier to systemic innovation. If no risk is permitted, the system freezes and innovation is impossible. Moreover, there therefore exists a direct and clear tension between accountability and innovation processes. As mentioned in the introduction to this chapter, this tension is exacerbated in times of economic crisis, during which funding for riskier ventures is considered too dangerous and is often first in line for budget cuts. Our argument is not that extreme levels of risk should be encouraged and supported, but rather that policy makers need to be aware that this tension exists and that, even in times of economic crisis, it is advisable to keep the system open to innovation within an acceptable but non-trivial level of risk. In times of greater economic growth, allowing more freedom for innovative risk and possible failure is consistent with long-term planning and vision, and is a basis for a strong innovation system.

It is worth noting, of course, that these are institutional as well as political issues. Institutional choices are made regarding how people responsible for governing institutions deal with change, the risks involved, and the level of acceptable (institutional and personal) risk. On a day-to-day level, the institution is the level of the system involved in implementing change and innovation, and the success or failure of initiatives can depend on the accountability mechanisms involved to a very large extent.

Lack of research evidence and consistent evaluation

Our project has looked closely at the role of evidence and research in the process of systemic innovation. The lack of such evidence has been identified as a barrier to systemic innovation in most, if not all, of the case studies we looked at. This final section, then, focuses on this analysis. For a more comprehensive discussion of the role of research and evidence in systemic innovation, see Chapter 6.

The question of how to ensure an adequate and sufficient flow of information during the process of policy reform is extremely challenging. There are questions concerning who is considered qualified and reliable enough to provide the information and the types of information that are considered useful and relevant to decision makers. The role of different knowledge sources (*e.g.* formal/academic, semi-formal, popular/media knowledge, general tacit knowledge) in identifying and developing innovation policy is an essential component to the understanding of the processes underlying systemic innovation. When we speak of "evidence", it is important to note that this includes both formal research from academic and other bodies as well as information from other, less formal, sources, including tacit knowledge from field-level stakeholders involved in implementing the innovation.

The initiatives chosen as case studies for this project address two central issues that all countries must tackle in their knowledge societies: *(i)* how to increase the responsiveness of the VET systems to current and future labour markets as well as individual needs; and *(ii)* how to avoid social exclusion of unskilled and low skilled workers. Many of the case studies nominated by participating countries were of extremely large scope (*e.g.* affecting the entire VET sector): Hungary's reform of *NVQR*, the Danish *Globalisation Council*, and Mexican reform of the *Technical Baccalaureate*. It is imperative that projects with such wide scope and deep impact on VET systems and labour markets be supported by solid data and rigorous research analysis during their design, monitoring, and evaluation phases. Such data should be open to the public and presented to the main stakeholders.

However, discussions with stakeholders in the countries suggested that there exists only a weak research base in VET and in systemic innovation in

VET in general. This is true for the knowledge base drawn on for the development of the innovation, including a lack of reliable and robust outcomes data for students taking VET. Across all countries, with the exception of Switzerland, we observed an overall:

- Lack of evaluating and piloting, which had
- Implications for scaling up and implementation, which in turn had an
- Impact on the timing and impact of the innovation.

For the first bullet point, it should be noted that the majority of innovations proposed for case studies were new, and have not yet had a completed evaluation. Therefore, it remains to be seen if some of the planned evaluations will prove adequate. Overall, however, even the planned evaluations did not appear to be designed by independent experts and did not necessarily address the most important topics (see Chapters 6 and 7 for further detail). Using poor or partial evidence to guide and implement systemic innovations in VET may lead to the failure of initiatives due to poor planning, and cause longer delays in implementation. It is also more expensive to correct errors during a full-scale implementation than during a pilot study.

Conclusions

The need to respond in a timely manner to the socio-economic challenges that all VET systems are facing in an increasingly globalised and rapidly changing world seems to be driving most of the systemic innovations that this project analysed. The lack of available skills in economies undergoing constant transformation, the need to enhance and enlarge the work possibilities of the trainees, and the need to include students in difficulties comprised a main engine in most innovations presented to us as case studies.

The innovation process also requires a number of enabling factors that can make the difference between a successful and unsuccessful innovation. More precisely, political leadership and capacity to steer and manage the innovation, the availability of resources, and/or the existence of regulatory mechanisms supporting the process seem to play a crucial enabling role in most systemic innovations. Equally, the availability of evidence and a good consensus among stakeholders also play crucial roles during the design and implementation of the innovations. Their roles seem to be so fundamental that these two dimensions have been treated separately in two chapters of this report (Chapters 6 and 7).

While these conclusions tend to have general validity for all VET systems, a number of particularities can also be identified to provide a more nuanced picture on these drivers, enablers, and barriers. Our research

suggests that the role of innovation enablers and barriers are not universal, but rather context-specific. This is particularly true for three variables: the role of evidence, consensus among stakeholders, and political leadership. The analysis of the case studies has shown that the innovations were often not initiated or guided by research evidence, but rather based on tacit knowledge and beliefs or an urge to change the *status quo*. While the lack of sound research and statistics in VET clearly contributes to these phenomena, the overall weak use of evidence in the development of systemic innovation is troubling given the key role that research plays in standard innovation models as well as the need to build evaluation feedback into system development so that success or failure can be meaningfully measured.

Similarly, while in all systems consensus among stakeholders can facilitate decisions to innovate and facilitate the implementation process, in dual tripartite VET systems consensus becomes crucial. These systems count on a long tradition of consensus building in the introduction of change, and although political leadership can encourage stakeholders to negotiate, a lack of consensus is often fatal for both the process and the innovation itself. In VET systems not based on a consensus model, political leadership could make up for this lack of consensus and allow the process to start and to move forward throughout its different phases.

Based on these findings, it would be difficult to suggest that any specific combination of driving and enabling factors would guarantee the success of any given innovations. Although it seems clear that systemic innovations may require specific enabling factors to be successful, the particular combination of these factors is apt to vary depending on the specific nature and scope of the innovation as well as on the context in which it is introduced. Moreover, depending on the specific stage of the innovative process, the combination of enabling factors may also be different. As a result, governments and stakeholders should be aware of this dynamic process so that they can identify the necessary enabling factors to foster for each stage.

Conclusions regarding barriers to systemic innovation are clearer, in that a lack of key drivers and enabling factors (*e.g.* lack of consensus of stakeholders, use of evidence, political leadership, etc.) clearly translates into barriers for the initiation, development, and implementation of systemic innovation. However, it cannot be forgotten that the process of systemic innovation involves numerous stages, and so barriers/drivers at one stage (*e.g.* development) may or may not play the same role at another stage of the process (*e.g.* implementation, evaluation). Both the fluid nature of systemic innovation and systems and the dynamic among contextual factors further this complexity. This chapter sets out examples in which positive enablers/drivers had unintended barrier effects, as in the role of European funding and resulting time constraints. Another example is a system-wide observation

on the tension between increasing accountability and restricting risk. In highly accountable systems there exists very little room for risk-taking, as the possibility of failure is too high. Although not a deliberate outcome or strategy, this tension between accountability and risk as well as other known unintended barriers must be monitored by governments and policy makers to allow systems to operate at the desired level of innovation.

Overall, a key theme of this analysis is that it is particularly perplexing to see both a lack of research evidence and cuts in the feedback-through-evaluation process in conjunction with the push for greater accountability and increased assessment of the system, teachers, and students. This is an incoherence in the system that needs to be addressed. Logically, if a system requires high levels of accountability, it should also require the use of evidence – including a genuine understanding of what the available evidence means, how it must be used, and how it must flow through the system to be taken up and used by other stakeholders. Such a system should also require the use of pilots and evaluations for learning and accountability purposes. Yet, in the systems we observed, this was not often the case.

A final note: in times of economic crisis the capital and margin of risk required to fund innovation and systemic change often results in such projects being considered disposable luxuries. Funds earmarked for innovative projects, or funds set aside to enhance and support innovative processes, often find themselves radically trimmed in leaner budgets. This is true of innovation as a whole and systemic innovation in the public sector in particular (see Chapter 2). In the VET system, the dual contribution of public sector (education) and the private sector (employers, firms) means that systemic innovation in VET risks getting cut twice, as both sides seek to rein in expenditures. In contexts in which employers need to be coaxed into entering into apprenticeship agreements, these programmes are difficult to justify if the firm is not convinced there exists a net financial gain to be had. Relevant and strong research on these questions, for example the cost/benefit analysis of apprenticeships for particular systems (Dionisius *et al.*, 2008), therefore takes on particular importance. Moreover, during financial crises, a number of enabling factors can start disappearing due to financial constraints and thus become limiting barriers for innovation. For example, a political urge to adopt rapid measures to show responsiveness can sacrifice the need for knowledge and/or consensus among stakeholders. Nevertheless, as in the previous cases mentioned, this would be contingent upon the specific context in which the innovation takes place.

Policy implications

The analysis of drivers and barriers in this chapter puts an emphasis on rational thinking and processes, while the discussion returns again and again to the observation that systemic innovation operates in a highly fluid dynamic. Decisions about when and how to support innovations may not derive from such a linear process, and, as laid out in the barriers section, barriers that arise may be unexpected outcomes of a seemingly positive enabler. The question for policy makers, then, becomes: what are the key ingredients for success in systemic innovation and VET? Moreover, how amenable to change are the foundations that create/contribute to barriers? The following set of policy implications seeks to identify and discuss these crucial factors:

- Governments must better understand the socio-economic drivers affecting the effectiveness, efficiency and equity of VET systems, and be better able to include this knowledge in their decision-making regarding innovation. Better tracking and research allows for both a greater understanding of the evolution of these drivers and, crucially, could allow for the identification of opportunities as well as greater ability to foresee unintended consequences of system change. The development of dedicated research institutes or analysis units specialised on VET issues is thus recommended. Some VET systems already have such institutions (*e.g.* Australia, Germany, and Switzerland). Other systems could learn from their experiences.
- Governments should identify enabling factors that could help implement specific innovations and develop their own successful "recipe" particular to their national or regional contexts. In addition, however, two specific framework conditions seem to be important across all regions and VET systems: fostering dialogue with all stakeholders, and encouraging the use of research evidence to initiate and/or guide the process.
- Specific policy recommendations could be suggested for tripartite dual systems, in which a long lasting and well-established research and consensus building culture seems already in place. In these systems, consensus building could transform into a barrier for the introduction of innovation. To avoid this impedance for change, innovation milieu should be created as experiments, in which the role of the necessary innovation enablers should be tested. The nature and scope of the innovations should also be taken into account.
- Government must not forget to focus on the dissemination and transfer of good practices. This means planning and funding specific knowledge transfer initiatives on the governmental level, and must also include means to reach schools, learning places, and professional

fields. From a middle or long-term perspective, the dissemination of the results from programmes and projects with a high potential for innovation is vital for maintaining a sustainable innovation culture and stimulating innovation policies.

- Also in terms of knowledge transfer, there needs to exist a mechanism for bottom-up feedback to be cycled back into the innovation framework and design (including, but not limited to, evaluation). This would also include ideas for the identification of needs and the genesis of innovations. Not only does this increase the possibility that good ideas will emerge from the field, including the private sector, it is also a way to increase the mutual trust between people with central responsibility and individual teachers and centres.
- Following from the barriers to innovation presented earlier, there is a need for political leadership in terms of creating an appropriate and supportive climate for innovation in the VET system. This includes the courage to establish a long-term strategy for the sector. In particular, it is recommended that there be an emphasis on creating the climate to foster:
  - An understanding of the process required for the development, implementation, and evaluation of innovations, as well as the political leadership to support the necessary processes and time required for innovations to yield results; and
  - An adjustment of the public management paradigm to allow room for risk-taking without being penalised for possible failure. This includes innovation of programmes and services, processes, and outputs.

Key messages

Drivers and barriers play different roles at different stages of the innovation process and can be thought of as direct determining factors that operate within contextual preconditions. These are distinct from enablers, which are influencing, but not determinant, factors.

Enabling factors that could help implement specific innovations are often context and system specific. Thus each system must develop its own successful "recipe" particular to its national or regional context. However two specific framework conditions seem to be important across all regions and VET systems: fostering dialogue with all stakeholders, and encouraging the use of research evidence to initiate and/or guide the process.

Major barriers include: innovation fatigue, competing policy agendas from different departments and Ministry stakeholders in VET (education, labour), and accountability mechanisms that radically restrict risk. The lack of strong empirical research is also a major barrier to the identification of needs and the successful implementation of innovations.

The key role of research in the process of systemic innovation cannot be overstated. This includes the dissemination and transfer of good practices. This requires planning and funding specific knowledge transfer initiatives on the governmental level, and must also include means to reach schools, learning places, and professional fields. From a middle- or long-term perspective, the dissemination of the results from programmes and projects with a high potential for innovation is vital for maintaining a sustainable innovation culture and stimulating innovation policies.

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