

Chapter 5

Process and Dynamics of Systemic Innovation: Initiation, Implementation, Monitoring, Evaluation and Scaling Up

Understanding the different stages and factors influencing the innovation process is of central importance in identifying needs for change in the system and guaranteeing successful innovation design and implementation. This chapter presents the empirical findings on the initiation, implementation, monitoring and evaluation and the scaling up of systemic innovation. In each of these phases, the chapter highlights the importance of stakeholder involvement and the crucial role that knowledge should play. The chapter closes with a number of policy implications that emphasise the need to create trust among stakeholders, develop and use knowledge to guide the process and ensure that the information generated in the monitoring and evaluation exercises is fed back into the system to enhance the existing knowledge base and to identify future innovations.

Introduction

The examination of the different stages of the innovation process is of central importance to the study of Systemic Innovation in VET. The process of introducing systemic change in education systems, especially VET systems, is not always clear-cut. Systems with different histories and traditions, including starting points and configuration of stakeholders, will not follow identical paths in this process, nor will every step of the way necessarily be deliberate and calculated, as the urgency of the drive for change will often affect the timing and planning of the process. This exploratory study does not aim to make definitive claims on what is “right” and “wrong” in the different stages of the process of systemic innovation in vocational education and training, but rather to provide an analysis that might allow countries to learn from the experience of the fourteen cases selected for study. Understanding the dimensions and possible implications of the different phases of the process of innovation should help policy makers and innovators reflect on how to best encourage adaptation to their changing environments. This chapter on the process and dynamics of innovation should be seen as complementary to the previous chapter on drivers and barriers in the process of systemic innovation.

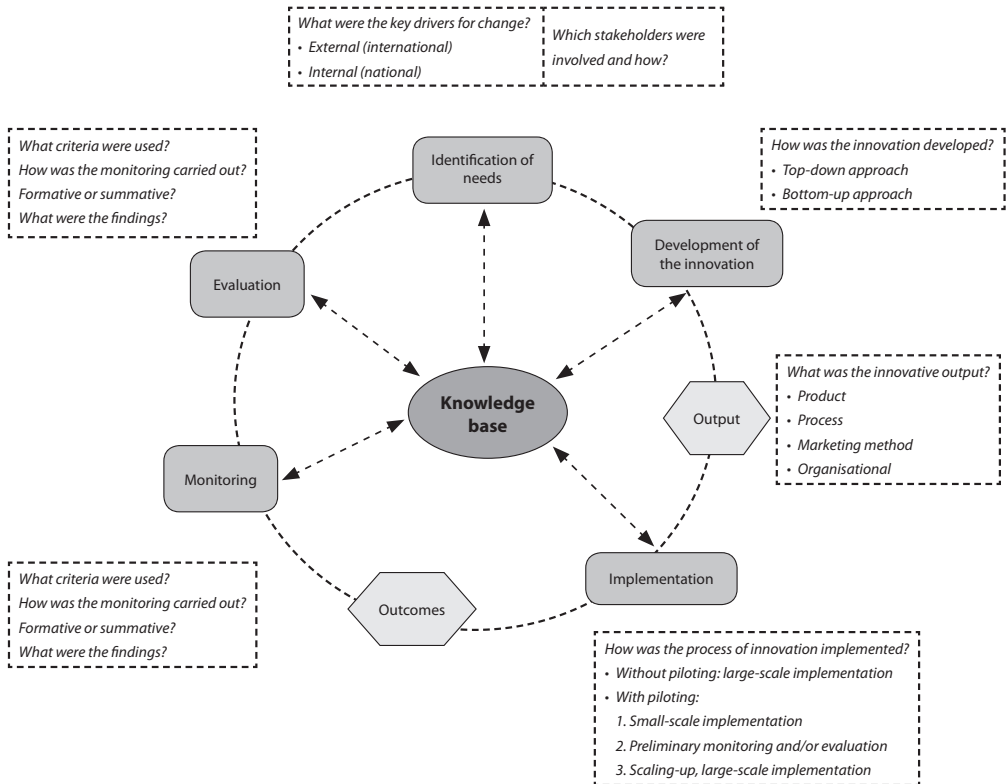
For the purposes of this study, systemic innovation is defined as *any kind of dynamic system-wide change that is intended to add value to the educational process*.¹ Utilising the framework outlined in the model of innovation (Figure 5.1.), this chapter will first attempt to situate the empirical findings in the initiation phase, from the identification of needs to the design of the innovation, and then lead into an analysis of the implementation phase. This section will be followed by an examination of the monitoring and evaluation, followed by the implications for scaling up.

Defining the stages of the process

The model of innovation in education from a systemic perspective was designed for this study to provide a structure for analysing the underlying components and stages of the process of systemic innovation in VET. This model provides a background to the analysis of the case studies, and includes the potential stages and elements of the innovation process in education. The square shaped boxes contain a number of key questions (with some typical options) that arise in the systemic analysis of innovations.²

The model takes as its starting point the identification of needs in the initiation stage, within which it will be important to observe the drivers of change. In the development of the innovation, which can be viewed as the second

Figure 5.1. Model of innovation



component of the initiation phase, the focus will be on the use of knowledge and the role of stakeholders involved in the innovation. In the implementation stage, the knowledge used and the stakeholders' involvement as well as the scale of the implementation of the innovation will be examined. Attention will also be paid to the role of incentives and motivating factors for implementation.

The role of knowledge and involvement of stakeholders will constitute a central focus throughout the analysis of the different stages of innovation and across the entire report. The use of the knowledge base can be seen, for our purposes, as central to the process of generating systemic innovation. As such, the use of different types of knowledge will be examined, including explicit knowledge (*e.g.* academic/research evidence, professional or practitioner knowledge, and administrative data/statistics) as well as general tacit knowledge, defined here as “*knowledge in the head*” (*i.e.* knowledge that

individuals have but that has not been codified or spelled out).³ The role of stakeholders in the stages of the process will also be viewed critically. Here, it will be important to examine issues such as the inclusion of relevant stakeholders, the timing of their inclusion, the degree of their participation, and the incentives for stakeholder involvement.

Initiation

The process of systemic innovation usually begins with the recognition of a problem or need, which in turn can stimulate research activities and further attention. A problem or need may rise to a high priority on a system's agenda through an agenda-setting process. As such, public institutions and policy makers as well as other stakeholders in the field can play a crucial role initiating and guiding the adoption of innovations in VET systems through, for example, funding, legislation, and leadership within regional, national, and/or international spheres.

Involvement of stakeholders

In examining the involvement of stakeholders in the selected systemic innovations, it is important to analyse the extent of stakeholders' involvement in the design and development of the innovation. In doing so, it will also be essential to look at the approach taken in initiating the innovation (top-down or bottom-up) and the way in which context of the system may affect the process of innovation as well as the existent supporting measures.

Although a common implicit assumption is that systemic innovations are often initiated at the top by governments, this is not always true, as innovations driven from the bottom also exist. This can be seen as comparable to the notion found in innovation literature, referred to as innovation initiated by the lead-user(s), who essentially develops an innovation and then convinces the system of its utility.⁴ The empirical evidence in this study reveals some instances of systemic innovations that are not started at the top of the hierarchy and instead follow a bottom-up approach, such as *Case Management* (Switzerland) and *the Mayan Riviera* (Mexico). The remaining twelve cases were deemed to have followed a top-down approach in identifying the need for an innovative initiative. Taken together, this suggests that due to the scope and nature of systemic innovation as defined in this study, such top-down approaches are more common.

It should be noted that the way in which cases were selected for this study may have also led to a somewhat biased over-representation of top-down led initiatives, as the selection was made by government officials in participating countries who might be less familiar with smaller-scale, bottom-up

projects. Furthermore, it must be acknowledged that the distinction between a top-down and bottom-up approach is somewhat artificial and used for our purposes to denote that the innovation was initiated at the top – though the distinction can become blurred throughout the different phases in the cycle of innovation. Still, the empirical evidence suggests that systemic innovations seem more apt to be top-down, given that their wide scope encompasses by definition multiple components of a system. However, more bottom-up initiatives do exist in the field of VET.⁵ Further discussion on finding ways of addressing this fragmentation and ensuring that findings from different types of initiatives can be disseminated or scaled up can be found in the second half of this chapter.

The role of the different stakeholders in the initiation phase appears to depend to a large extent on the scope and nature of the systemic innovation. System-wide innovations, as defined for this study, appear to be more likely to follow a top-down approach due to their nature and scope, regardless of the type of system. The significance of relevant groups' involvement and the degree to which they could be implicated also varies, depending on the context in which the systemic innovation takes place. VET systems with long and rich traditions, such as those in Denmark, Germany, and Switzerland, tend to enjoy a higher status, measured in terms of student enrolment rates. As VET is highly regarded, it may be easier for a problem or need to rise to the top of a political agenda to initiate the process of innovation. As such, public actors in these traditional systems can play a crucial role in initiating and guiding the adoption of innovations in VET systems through funding, legislation, and leadership in the regional and national spheres.

The empirical evidence available suggests that many innovations initiated by governments in countries where VET enjoys a high status have aimed to respond to pressing economic challenges, such as adjusting training supply to the economic needs of a productive structure. This adjustment could involve core transversal competencies, such as managerial skills in the reform of *Basic Commercial Training* (Switzerland), or the entire system, as in the *Globalisation Council* (Denmark). A further advantage of initiating innovation through a top-down approach in these countries is the crucial role that public institutions and politicians have played in initiating the innovation process. For example, strong political leadership and will to bring the different stakeholders together were key forces behind the creation of the cases studied in the *Innovation Circle* (Germany) and the *Globalisation Council* (Denmark).

However, the advantages of political will and support in innovation driven from the top is not necessarily limited to systems in which VET enjoys a high status. A variety of public institutions and figures played a fundamental role in initiating the *Reform of the Technical Baccalaureate* (Mexico), a country with a relatively short tradition of VET, where the field also suffers

from low status. Also, political legislation and funding from the European Union drove and supported the systemic changes initiated in Hungary with the creation of a *National Vocational Qualifications Registry* (NVQR), though VET in Hungary is also a relatively recent and under-appreciated phenomenon. Although less traditional systems can in some ways be more open to change than those with a longer tradition, the importance of political will in initiating and supporting innovation cannot be underestimated.

Although there may not be ample evidence to fully explore this dimension here, there would seem to be a relationship between innovation in workplace/continuous training and a bottom-up approach to the initiation, as seen in the only two cases considered to have followed this type of approach: *Case Management* (Switzerland) and *the Mayan Riviera* case (Mexico). This may be due in part to the role of the private sector in identifying needs and initiating innovation directly relevant to training provision, resulting in a swifter process than initiatives begun in the public sector, where the governance structure is often more complex to navigate. However, the more challenging aspect for bottom-up cases such as these may appear in involving the public sector in later stages and in scaling up, as will be further discussed in this chapter.

Regardless of whether an innovation is initiated from top or bottom, the question of which stakeholders to involve in the design and development of the innovation becomes crucial. In systems that adhere strongly to the consensus principle, such as Denmark, Germany, and Switzerland to varying degrees, an agreement among all stakeholders, including employers' associations and trade unions, is necessary. This could generally be seen as a virtue of the system, particularly because it should promote a situation in which the views of all are taken into account, leading in principle to the development of an innovation strengthened by the knowledge inherent to each stakeholder group. Furthermore, the inclusion of relevant stakeholder groups during the design and development components of the initiation generally increases sentiments of ownership from stakeholders affected, a crucial element in the implementation phase and often relatively challenging to achieve in top-down innovations (as discussed below).

However, it is important not to overstate the merits of consensus-building in a system, as it carries its own challenges if consensus becomes a necessity. When all stakeholders must agree on the development of an innovation there is a risk that the principles eventually agreed upon will reflect the lowest-common denominator. In addition, VET systems, unlike education systems in general, include the public and private sectors as well as employers and social partners, whose various interests can in practice be difficult to reconcile. The bottom line is that the interests of the various stakeholders can result in risk-avoidance if they can only reach agreement on a common denominator. Avoiding risk will not generally be conducive to the process

of systemic innovation, which often involves an inherent element of risk. As time is necessary for all parties to agree, the consensus model often requires a lengthy process, which may well result in a compromise less likely to be as far-reaching. This practice may tend to lead to the design of more incremental innovations. While this is not in itself negative, it must be kept in mind that if stakeholders hold the view that incremental innovations are continually arriving, those stakeholders may experience innovation fatigue either in the development or implementation phases and subsequently develop the sentiment that it may not be worth the effort to co-operate in the process, as another initiative will surely follow.

Limited stakeholder involvement may in some cases be seen in top-down innovations as facilitating a swifter process with less resistance encountered along the way. In the *Technical Baccalaureate* reform (Mexico), it appears that while building consensus and involvement among a broad range of stakeholders is worthwhile, this may not always be necessary to initiate a systemic change. The strong leadership of the Secretary of Education allowed for designing the reform and moving it forward in a relatively short time span, although it should be noted that this course of action did not resolve the implementation gaps later experienced that could have been foreseen and resolved had a wider involvement of stakeholders been developed. Furthermore, the teachers and teacher unions were contacted, though not fully consulted. This lack of consultation led to knowledge shortages as well as implementation challenges (as will be discussed in the section on implementation).

Because they run wide and deep, systemic changes can generally benefit from the involvement and experience of a wide range of relevant stakeholders, as there exist larger numbers of actors who could be potentially affected. However, smaller-scale initiatives and those initiated from the bottom-up tend to involve a wider range of stakeholders on a deeper level, even though the scale of the innovation may not require it as such. In the two case studies featuring bottom-up innovations – the *Basic Commercial Training* (Switzerland) and the *Mayan Riviera* case (Mexico), both of which were essentially pilots – many relevant stakeholders across the public and private sectors were implicated in the initiation phase. Furthermore, that the former case has featured an interactive piloting system should help promote the current and continued consideration of monitoring and evaluation during the scaling-up process. In the latter example, for all practical purposes an unintended pilot, an evaluation is already underway to analyse how the components of the process functioned and could benefit from a focus on the role of stakeholders, especially as many of those involved were brought into the equation more through personal contacts than through a formalised solicitation. The sections in this chapter on monitoring, evaluation, and scaling up will discuss these phases of the process for these Swiss and Mexican cases in more detail.

While this study has been examining the process of generating innovation, it is worth mentioning empirical evidence on processes, which involve inherently innovative components and can in this case be seen in the way stakeholders were brought into the equation (which could be viewed as process innovation). In the German case study of the *Innovation Circle*, consensus-building was very much the norm – albeit in an unusual way. Stakeholders involved in designing the innovation were invited to the negotiations based on their personal demonstrated interest and experience in VET. This novel method helped to ensure that the actors would be less likely to merely represent institutional interests, and more likely to represent the interests of the VET system in its entirety. Box 5.1. take a closer look at this innovative process in an otherwise largely traditional system.

Box 5.1. Germany: the Innovation Circle

The Innovation Circle was from the outset different from the regular policy space of the tripartite German VET system in its design. The typical procedure in the German VET system governance is that each stakeholder selects a representative to bring forward their interests in a negotiation process; in contrast, participants in the Innovation Circle were appointed by the Minister as individuals with insights into different aspects of the VET system rather than as system representatives, though indirectly it included representation of all system stakeholders at a high level of formal influence. The Minister's aim was for the Innovation Circle to take a systemic view of the VET system through a broad definition of the agenda under four main headings, rather than focusing on specific policy topics. Implicit in this design was the Minister's intent to spur a process of informing and opening the mindsets of all involved in its governance of medium- and long-term challenges.

The Innovation Circle was chaired by the Minister, and included representatives from the Federal Ministry of Labour and Social Affairs, the Ministry of Economics and Technology, the Federal Employment Agency, and the Federal Institute for Vocational Education (BIBB). It also included representation from the Standing Conference of the *Länder* Ministers of Education (KMK) and the Conference of *Länder* Ministers of Economic Affairs (WiMiKo), as well as employers' representatives, part-time vocational school head teachers, and researchers. The sense of urgency imparted and high formal status of many involved made it important to frame the work and deadlines so as not to lose momentum through endless discussions.

Although this was not a the first time that such an *ad hoc* group or task force was set up directly by a Minister to address a particular policy issue, the design of the Innovation Circle included innovative elements, such as the fact that members were appointed in a personal rather than institutional capacity to foster debate free from institutional interests. However, several stakeholders pointed out during their interviews that such “unbiased” points of view were not always possible during the debates, particularly since stakeholders knew each other and the points of view they each represented rather well.

The lines between the role of stakeholders and the role of the knowledge base are often blurred, as it is also possible for stakeholders to be approached not so much for their formal involvement or approval as for the knowledge they possess, which might be useful in the design and development of the innovation. In this approach, actors and stakeholders are often consulted or communicated with rather than fully implicated in the design and development of an innovation. It should be noted that the definition of “consultation” can widely vary in depth and degree. If the consultation or communication is seen as superficial, it is possible that stakeholders who see themselves as potentially affected by an innovation may feel marginalised by such an approach, which, though designed in part to be inclusive, may give the impression that these stakeholders’ opinions are less important than those of the people who are more fully implicated in the process. Conversely, true consultation with stakeholders tends to increase sentiments of trust. It can be gleaned throughout a number of the cases that short time-spans may have been largely responsible for cutting short the consultation stage with some key stakeholders. This can result in resistance during the implementation phase, a topic discussed in the next section.

The empirical evidence also indicates a number of other cases that could have benefitted from a more inclusive approach to stakeholder involvement in the design phases, for example regarding the involvement of social partners and trade unions in the *Case Management* (Switzerland) or school representatives in the *NVQR* (Hungary). This was to some extent the case in the Mexican *Technological Baccaulaureate* case study, in which representatives from teachers’ unions received information from the Ministry of the changes afoot in technical education on everything from curricular content to organisation. Though the teachers’ unions were presumably contacted precisely because of the knowledge they, as practitioners, possess in the field, they were left seeming miffed that their voices had not been more formally solicited during the design and development of the process, feeling instead that they were simply being informed of the changes. It should be noted that the Mexican VET system, as a relatively new system, underwent in this case study a wide and deep change that benefitted from strong leadership and contextually differed from a number of the other case studies.

Use of the knowledge base

An adequate and sufficient flow of information during the process of systemic innovation is critical to the perceived relevance by users, both to build trust and increase the uptake of outcomes and to inform scaling up at a later stage when applicable. Evidence can contribute to the design of the innovation process, the identification of potential difficulties during the subsequent

stage of implementation, and reduce resistance to change among stakeholders if there exists evidence regarding the benefits the change may bring about.

For the purposes of this chapter, the use of the knowledge base is regarded in the broad sense to comprise: explicit knowledge, such as academic or research evidence; professional and practitioner knowledge; administrative data and statistics; and general tacit knowledge. Thus, “knowledge” here includes both formal research from academic and other bodies and information from other, less formal sources. Although these different types of knowledge in stages of the process will be examined in turn, the terms “knowledge” and “evidence” are also used in this chapter to comprise any/all of the above. The use of knowledge will be discussed as a main topic in greater detail in Chapter 6, as will the research agenda in Chapter 9.

The typology framework contained in Chapter 7 reveals that there appears to be no clear pattern emerging regarding the types of knowledge used in the different stages of the process. However, overall it became apparent in the cases studied that a large number of initiatives were triggered by tacit knowledge or small-scale responses to imminent problems faced. Despite the important role that formal research might be expected to play in the initiation of systemic innovation, a review of the case studies undertaken seems to suggest that this was not always central to the process. Several of the innovations were seen as initiated largely because of agreement on the need to innovate, prompted by small-scale responses to impending problems, such as economic or social challenges.⁶ Perhaps due to the urgency of such needs, the opportunity to take evidence into account was not always present. Aside from statistical figures of labour market development and unemployment situations that were sometimes utilised in initiation phases to illustrate the need for the innovation, the use of regular, relevant, and objective data feeding into the process was often missing or considered secondary.

The use of international evidence and statistics in initiating innovation was relatively scarce in the cases studied, and with the exception of two of the countries with more recently-established, less-traditional VET systems, there was little evidence of attempting to learn from international experiences. International benchmarking and funds from an EU initiative these cases were not necessarily based on formal research knowledge. In the case of the *Technical Baccalaureate* reform (Mexico), the innovation explicitly drew on the experiences of Latin America and Europe as well as results of international benchmarking.

In this case from Mexico, an interesting aspect is that the systemic innovation studied followed a previous reform effort. This effort, largely acknowledged as unsuccessful, attempted to replicate international evidence from the United Kingdom but lacked adequate adaptation to the Mexican context. However, in the *Technical Baccalaureate* reform, the Secretariat for Public

Education and academics from local institutions surveyed international curricula and norms regarding different professions at the time when the new curriculum for the reform and new potential entry-points into the labour market were being designed. What is encouraging in this case is that although the previous attempt at innovation did not succeed, the less-than-positive experience did not discourage subsequent innovation; instead, it served as a lesson learnt on the importance of gathering evidence on the local context in detail and of avoiding straight replication of international evidence in the process of initiating innovation. Further discussion on learning from initiatives through the feedback loop of evaluation will be covered in the evaluation section of this chapter.

Aside from the use of international evidence or statistics, the use of administrative data and statistics on a national, regional, or local level was also used in the initiation phases of several cases studied. This was seen in the *Case Management* study (Switzerland), as it was the data indicating high dropout rates among certain groups of youth that led to the initiation of the case management model to support the transition into VET. The use of similar administrative data and statistics in the initiation and development of innovations was seen in as many as half of the cases studied. That this type of knowledge was solicited more frequently in the initiation phase than any other type and across all systems suggests that it may be the most straightforward and readily available type of knowledge from which to draw upon.

However, administrative data and statistics, especially if taken in isolation as they sometimes are, do not necessarily tell the “whole story” in the way that other types of research, such as academic research, can. Academic research and evidence can be especially beneficial in the process of initiating innovation, and can serve to inform the process of innovation in VET, particularly in the initiation and development stages. In addition to contributing to the design of the innovation process, research evidence can also facilitate the identification of potential subsequent barriers in the process. This can prove especially useful during the implementation phase, and may reduce resistance to change among stakeholders if there exists sufficient evidence on the benefits that the change may bring about. A prime, albeit rare, example of this in the cases studied was that of the *Skola Project* (Germany), initiated by researchers who convinced the Länder authorities to undertake the initiative and select the necessary schools to participate. It was informed by relevant academic research and literature on the effects of self-regulated learning on education and on educational psychology. The role of academic research and academic evidence was crucial both in persuading the different stakeholders to participate in the innovation and in facilitating the design and implementation, as it provided the content for the design of the training programme as well as the necessary measures to be adopted for a smooth implementation that would minimise the resistance to change among stakeholders.

Research evidence of improved teaching or learning processes or of the provision of new services or organisational methods in VET can be considered an essential element that should inform the innovation process, but it can also play a role in driving the initiation of new innovations. The perceived need to bridge the gap of national research evidence largely drove two of the systemic innovations in the initiation phase: *Leading Houses* (Switzerland) and *Research and Statistics in VET-NCVET* (Australia). That the leaders of these innovations, mostly with ample experience and research backgrounds, were able to proactively bridge these perceived evidence gaps instead of simply viewing them as a handicap is a positive development of how a perceived weakness can become an enabler of innovation.

In a number of cases in the more well-established VET systems, the recognised dearth of codified formal knowledge has led to the conception of new knowledge for the purpose of developing innovations. This includes *Case Management* (Switzerland), *Innovation Circle* (Germany) and *Globalisation Council* (Denmark), in which new surveys, studies, or reports were commissioned specifically to gather evidence for the purposes of initiating the new innovation. These findings suggest that in tri-partite systems with well-established traditions there may be greater recognition of the importance of specific knowledge generation. The evidence suggests that it is not, however, exclusive to such systems, as can be seen in the *National Vocational Qualifications Framework* (Hungary), in which an analysis of tasks, skills, and competences for close to five hundred different skills and trades was undertaken. Though the process of generating this knowledge may not have been as organised as it could have been, the result was a new body of formalised professional knowledge.

Implementation

Oftentimes, it becomes clear during the implementation phase that some of the challenges experienced have at their foundation components that could have been better planned during the initiation or design phases. The following section will outline some of the characteristics of the implementation of systemic innovation and will include discussions on different paths that could affect hurdles and implementation gaps, paying attention to the role of stakeholders and knowledge in the process.

Role of stakeholders

Whom to involve and when to involve them in a systemic innovation are two of the most important elements of the process of systemic innovation. However, there are not always deliberate decisions taken in this vein, as some must be involved by default, and groups of stakeholders, such as

interest groups, may get involved in the process whether formally invited or not. As it is not always possible to plan ahead for such occurrences, the importance of clear objectives and guidance plans for stakeholders likely to be directly affected cannot be underestimated. Under this same heading of clarity of roles is the importance of the presence of a strong leader, often in government, to champion the systemic innovation and whose vision will be important to keeping momentum.

Essential to the smooth implementation of systemic innovation is a clear set of roles of the players involved, drawn up beforehand by the group or groups leading the design and development of the innovation. Clear guidelines can help the intended users of an innovation to understand and to effectively put the new features of the innovation into practice. For example, in the *Innovation Circle* (Germany), a key recommendation was the development of a communication plan as well as a specific methodology. Strategies to communicate new roles were part of the development of the innovation in other case studies and intended to encourage smooth implementation, though they were not always successful, such as in the cases of *NVQR* (Hungary) and *Case Management* (Switzerland).

As in the initiation phase, the importance during the implementation phase of assessing which stakeholders to involve along the way proves crucial. Although this is not always an active decision in practice, stakeholders who view themselves as highly affected by innovations, such as teachers, may demonstrate resistance if their views are not implicated in the design and development stages. This should not be confused with a more general resistance to the particular innovation, a possibility that may not be directly linked to the events of the initiation phase.

The empirical evidence suggests that oftentimes the decision of whom to involve can be based around practical issues, such as time and ease. In cases with particularly tight schedules for implementation, it appeared as though the key stakeholders most willing to co-operate, sometimes including those involved during the design phases, were solicited. Other times, priority seemed to be given in earlier phases to one group of stakeholders over another, such as labour market representatives over school representatives in the *NVQR* (Hungary). While this may be indicative of the inherent tension in VET between the education sector and the labour market, the empirical evidence suggests it is important to weigh such decisions extremely carefully.

Other cases suggested that even when it was seen as undesirable to involve all stakeholders in the initiation and design phases, efforts could be made to build bridges among the different groups. For example, in *Step One Forward* (Hungary) stakeholders were not actively involved in the design of the innovation, but efforts were made to forge links among the various levels and groups involved. This case also provides examples of successful

links among different levels and stakeholder groups (at the national, regional, municipal and individual level) as well as interaction with at-risk target groups. There were also innovative attempts made to include diverse stakeholders through less traditional means, such as mentors. The bridges and connections established through these efforts seemed crucial in ensuring a smooth implementation process with opportunities for continuous feedback.

It is important to highlight the important roles of political leadership and funding in the implementation stage. These are of particular importance in bottom-up innovations, which may not have public sector support from the outset. In cases in which innovation is initiated by an actor outside of the public sector, public actors can play an important role in providing an enabling environment that allows these innovations to thrive by bringing stakeholders together, providing funding, or eliminating potential legislative barriers that could hinder the implementation of the innovation. This type of capacity is especially important when the innovation is destined for scaling up. The *Mayan Riviera* case (Mexico) provides an example of how government, at both Federal and State level, can capitalise on an initiative started in the private sector and the crucial role public authorities play when an initiative is intended for replication in other sectors of the economy or geographical areas.

When reflecting on implementation, it is important to look at what factors can help to enable a smooth implementation of a systemic innovation. One type of inherent incentive for stakeholders and/or users to continue to co-operate in implementation may be the sense of ownership for those who have been involved or at least consulted in designing and developing a systemic innovation.

The presence of pre-existing extrinsic incentives may also be useful in smooth implementation. An example of this in the cases studied would be in the *NVQR* (Hungary), in which students had a pre-existing extrinsic incentive to utilise the qualifications framework, as it was the only one nationally recognised. When a systemic innovation features an incentive of this nature, it is likely to facilitate smooth implementation and take-up by users. Incentives of this nature are, by definition, pre-existing, but to recognise and use them when possible can prove advantageous.

Stakeholders and users may also perceive disincentives for implementation. The context of the system hosting an innovation can largely affect the take-up of the innovation by users and stakeholders affected by the innovation. In a relatively young system open to innovation, if stakeholders hold the view that a series of incremental innovations are continually arriving, they may experience innovation fatigue (*i.e.* the sentiment that it may not be worth the effort to participate in the implementation as another initiative will surely follow). Disincentives such as this must not be ignored and continual

“innovation for the sake of innovation” will usually not encourage participation and co-operation in implementation.

Use of the knowledge base

Overall, the empirical findings suggest that many of the top-down, far-reaching initiatives tended to be the most likely to systematically take the knowledge base into account in its different forms, though it is impossible to make this claim across the board. Notable examples of this include the *Globalisation Council* (Denmark) and the *Flexible Learning Framework* (Australia). While this finding on the whole is positive, it remains somewhat surprising that there was not further empirical evidence regarding the central role of the knowledge base in systemic innovations in VET. Tacit knowledge was used throughout the implementation of nearly all of the systemic innovations, in the sense of know-how exchanged through discussions and consultations. This type of knowledge is valuable but can be difficult to capture and may pose a challenge for VET practitioners and researchers, as will be discussed in Chapter 6 on the knowledge base.

The nature of the existing knowledge base in a system, as well as whether the system has a long VET tradition, certainly holds part of the explanation. One of the farthest-reaching initiatives, the *Technological Baccalaureate* (Mexico) was implemented with comparatively minimal formal knowledge or research. However, as mentioned in the section on initiation, the Secretariat for Public Education and local academics surveyed international curricula and norms for different professions during the innovation’s design, and this helped to make the implementation process smoother. Though the use of knowledge was not extensive, it was well targeted and served the innovation in this relatively young VET system well.

How to ensure an adequate and sufficient flow of information between different groups of stakeholders during the implementation of systemic innovation is also of interest. Stakeholders affected along with current and potential users of an innovation can prove a valuable source of information. Stakeholders may be approached for their knowledge, blurring the lines between the two axes analysed throughout this study. Such actors may have a great deal of knowledge, specifically tacit knowledge, to share, and can be some of the best sources of expertise relating to implementation of systemic innovation. A good example is the case is the *Flexible Learning Framework* (Australia). During the implementation, there was extensive use of tacit and informal knowledge of stakeholders at all levels. This included the use of reviewers from industry, students, trainers and teachers, as well as multimedia program developers. Often, a systemic innovation in which the stakeholders with knowledge to contribute have been approached for their knowledge

can experience a smoother implementation process, perhaps more so than when formally implicated in the decision-making process.

Some cases were almost entirely based on such semi-formal knowledge sources, such as the *National Vocational Qualifications Register* (Hungary), which featured minimal inclusion of formal knowledge sources. However, care should be taken not to include only semi-formal knowledge from a large number of one group of stakeholders (in this case, more than 9 000 labour market “experts”), as it becomes unclear both to what extent such vast amounts of semi-formal knowledge could be used and why other affected stakeholder groups, such as teachers, were not consulted in depth when another group of stakeholders provided such vast feedback.

Capacity building, or the sharing of relevant knowledge with the stakeholders involved in the implementation of systemic innovations, is crucial to smooth implementation. The empirical evidence suggests that this support is especially important in the cases in which there was a more limited involvement of stakeholders in the earlier stages. For example, in the *Technological Baccalaureate* case (Mexico), teachers, who were contacted but not fully implicated in the design phases of the reform, had trouble understanding the objectives of the far-reaching reform as well as how to implement them, due to a capacity-building initiative that was insufficiently comprehensive. Similarly, before the implementation of the *NVQR* and *Step One Forward* (Hungary), efforts were made to train the teachers and mentors, but this undertaking proved neither adequate nor timely. These illustrate a need for more careful capacity building for the stakeholders involved in the implementation of innovations, and also suggest a challenge for the system. These cases also further raise the issue for systemic innovation of how, in a top-down system, capacity building of professionals in the field can be adequately developed.

The use of formalised knowledge and analysis on outcomes of previous systemic innovations reforms can facilitate the implementation process by providing more continuity between past and current changes of policy, especially when closely related. For example, in the *Globalisation Council* case (Denmark), more data on how the previous associated reform had functioned would have been useful for stakeholders in the implementation phase. There had been difficulties in the implementation phase of the previous reform as well; identifying these difficulties would have been important in learning from past experiences and putting users at ease. This illustrates the importance of monitoring and evaluation, which will be further discussed in the next section.

Monitoring and evaluation

Introduction

Monitoring the implementation and progress of any initiative is key to ensuring that the process is following the planned path, identifying any divergences between that path and reality, and, if necessary, defining any corrective measures. Systemic innovations are no exceptions, and their monitoring represents a crucial phase. Monitoring exercises allow not only assessment of the ongoing results of the innovations but also identification of implementation gaps and potential barriers that were not foreseen, thus providing the opportunity to define measures to overcome these barriers. The information gathered from these exercises is therefore crucial.

Evaluation is “an assessment, as systematic and objective as possible, of [an] ongoing or completed project, programme or policy, its design, implementation, and results. The aim is to determine the relevance and fulfilment of objectives, developmental efficiency, effectiveness, impact and sustainability. An evaluation should provide information that is credible and useful, enabling the incorporation of lessons learnt into the decision-making process.” (OECD, 1998) As such, evaluation is a main phase of the innovation process, as it can help improve the innovation process and assess the achievement of the objectives intended with the introduction of the innovation. It is also intended, through the use of a feedback loop, to guide both the planning and the implementation of further innovations of a similar nature.

The evaluation of systemic innovations can be complex exercises, because in many instances these initiatives may bring about many different, and sometimes unexpected, results, depending on the degree of novelty of the adopted measure. Nevertheless, evaluations are necessary exercises that can be carried out at different periods of time with different objectives. *Ex ante* evaluations identify the potential benefits that the innovations could bring about before their actual implementation, and are fundamental to gathering information about the potential benefits and informing the process of making decisions. They are also instrumental in facilitating *ex post* evaluations, as they identify the potential final benefits that would need to be investigated in these *ex post* evaluations. Interim evaluations are usually undertaken at mid-term to review progress and propose alterations to project design during the remainder of the implementation. They are complementary to the monitoring exercises, and can be instrumental in analysing and assessing the process of implementations of the innovations and also warn of potential barriers that may need to be overcome. Finally, *ex post* evaluations are carried out after the innovation has been fully implemented, and focus mainly on assessing their impacts. In the case of systemic innovations, depending on the nature and scope of the changes

envisaged, their impact can be quite broad and may require a substantial time to accrue and become visible. The information gathered in these evaluations is crucial not only for assessing the success or failure of the innovation but also for feeding the innovation policy cycle. Due to this importance, sufficient resources should be available to ensure that evaluations are properly carried out and achieve their objectives.

Empirical evidence

Most of the innovations from our case studies had gone through a monitoring exercise. In some cases (e.g. the *Innovation Circle* [Germany]), no monitoring was foreseen due to the relatively short life of the project and its rapid dynamism, which did not allow for significant monitoring. This exercise would have delayed the project and would not have provided any meaningful recommendations for the correction of the implementation.

In general, the monitoring of the implementations was commissioned by the governments and carried out by independent research centres with the aim of ensuring the impartiality of the results. This was the case in Hungary, with the National Institute of Vocational Education and Adult Training; in Australia, with the Flexible Learning Advisory Board; and in Denmark, with the Danish Evaluation institute. Moreover, the inclusion and interview of stakeholders during the monitoring exercises was common, providing relevant stakeholders with the opportunity to be actively involved in projects throughout the process.

The results of the monitoring were generally considered and in many cases determined whether funding of the initiative would continue, as in the case of the *VPET Case Management* (Switzerland). To ensure that the results of monitoring are properly taken into account and fed into the implementation process, in many cases monitoring committees composed of different stakeholders were created. In particular, *Leading Houses* (Switzerland), *VPET Case Management* (Switzerland), *Step One Forward* (Hungary) created Research Steering Committees; this can be regarded as good practice. These committees ensure that proper and timely monitoring is in place and that the results of these exercises are fed back into the initiatives. In some other cases, external and internal monitoring groups were developed *ad hoc*.

In terms of evaluation, however, the situation is less rosy. Neither *ex ante* nor interim evaluations were foreseen or implemented in most cases. As mentioned in the introduction, the knowledge generated through these exercises could be valuable in informing the overall process from the beginning of implementation. Furthermore, these evaluations could provide a framework for a closer engagement of the concerned stakeholders from the beginning to the end of the innovation.

Box 5.2. Monitoring and evaluation of the Australian Flexible Learning Framework

The Australian Flexible Learning Framework aims to develop a national e-learning infrastructure and delivery for VET. In doing so, it aims to maximise national connectivity between all participants in the VET sector, develop greater choice and flexibility in both the range of training and models of delivery available, and increase cost effectiveness by developing a united strategy.

The Framework, which began officially in 2000, is a collective agreement on priorities supported by contributions from each state and territory. The first phase of the Framework ran from 2000-04, and focused on investing in capacity-building and raising awareness of e-learning in VET. The second phase ran from 2005-07, and in addition to capacity building it also engaged in client engagement, including industry.

For monitoring and evaluating the outcomes of its various activities, the Framework has a complicated and relatively intense design, which is overseen by an advisory board composed of the National Centre for Vocational Education and Research (NCVER) as well as academic researchers. More precisely, in terms of monitoring, internal and external reviews of operations and impacts are regularly carried out, and a yearly business plan is produced. Moreover, it is required to provide twice-yearly progress reports on both the business plan and the activities of the framework.

The main evaluation initiatives include:

- An annual benchmarking survey (in 2005, 2006, and 2007) on the uptake and use of e-learning by VET providers, teachers and trainers, students, and employers (for this survey, every two years). The 2007 survey showed that the use of technology in VET quadrupled in the three years since the first (2005) survey, and now comprises 29% of VET activity, broadly defined. The survey also provides information on how technology is used by teachers and trainers, how it is perceived by students and employers, and allows for comparisons by state and territory.
- An impact statement that uses the results of the Benchmarking surveys along with qualitative data on impact and snapshots of practice, as well as an analysis of financial benefits.

Future commissioned research will look at the impact of champions, the spread of e-learning, e-learning and employability, the role of e-learning in basic skill formation, and the provision of advice on copyright issues.

In addition, most of the cases had not followed a formal *ex post* evaluation at the time of the visit; however, in most cases such an evaluation was foreseen and scheduled. Most of the innovations are ongoing or have been recently concluded, and therefore *ex post* evaluations to assess all the impacts are difficult. As a result, as will be presented in Chapter 6, this information has not been made available yet for further policy design in most cases.

However, a couple of the analysed innovations had already gone through an evaluation process. In Switzerland, the Reform of the Basic Commercial Training, an innovation that began in the late 1990s, went through a cost-benefit analysis in 2004 that proved that the benefits of the reform in terms of better-qualified students outweighed the costs. Evaluations between 2004 and 2007 were also carried out. These evaluations dealt with three central fields, namely the acceptance, feasibility, and effectiveness of the individual innovation and processes that formed the backbone of this reform. All relevant stakeholders, including those responsible for VET in firms, vocational schools, and apprentices agreed that the new basic commercial training programmes prepared apprentices adequately for their future professional lives.

In addition, the Australian Flexible Learning Programme, which began in the year 2000, also followed a formal *ex post* evaluation exercise. This exercise is described in Box 5.2.

This example illustrates the wealth of information and knowledge that can be generated in evaluation exercises. This type of information can be used not only for accountability purposes but also for engaging more stakeholders, facilitating the dissemination of a successful experience to other geographical areas, and improving policy learning. This exercise provides valuable knowledge for the future formulation of activities.

Other informative evaluations could also expand the current focus on impacts, and expand it to analyse successful processes that could inform future systemic innovations.

Piloting and scaling up

Introduction

Systemic innovations in VET are those that bring about change across either the whole VET system or a substantial part of it. As presented earlier in this chapter, these innovations can be either planned and centrally directed, following a top-down approach, or emerge from specific institutional or geographical parts of the system (*e.g.* schools, municipalities, and regions) and then spread across the system.

In the first case, top-down initiated and implemented innovations, the leading actor, often the government, may first desire to test the initiative in small pilot projects to observe the expected and unexpected effects of the proposed changes in a limited controlled area. In addition, these pilots can serve to identify the contextual factors that may act as catalysts or barriers for these innovations. Based on the results of these pilots, a widespread implementation may then be decided. Equally, discrete innovations may accrue in a particular setting without initially intending to cover the whole system. However, after observing the potential benefits that these innovations may generate, the extrapolation of these initiatives to other areas of the system may be explored. This extrapolation could be done to other geographical contexts, other economic sectors, and other institutional settings, depending on the specific innovation.

The scaling up of pilot projects and of particular initiatives to the overall system is always a complex process, and may reveal further difficulties in the implementation or replication of the initiatives. These may be highly context-specific, and their pre-conditions of success may be difficult to recreate in other contexts. This section analyses the empirical practices that have been placed in the analysed case studies of this project.

Empirical evidence

The empirical analysis of this project has revealed that most systemic innovations in our study tend to follow a top-down approach. According to our evidence, centrally steered and planned innovations seem to be more numerous when system-wide impacts are intended. There may be many reasons for this. The identification of an overall perceived need in the system may be easier at a central level, as the focus of governments' study and activity may be better suited for this type of innovation. Moreover, systemic innovations tend to involve a large number of stakeholders at many different institutional levels, and therefore centrally located organisations (mainly governments) may be more capable of reaching and coordinating with these stakeholders. Also, in many cases, the systems may not count on the necessary conditions to identify and disseminate bottom-up individual innovations across the system.

In any case, this finding should be handled with care, as our research focused only on a limited number of cases, and therefore it would not be possible to draw a definitive conclusion. In the context of the case studies analysed in this project, only one project showed the potential of geographically localised initiatives being scaled up to other areas of the VET system. *Mayan Riviera* (Mexico) illustrates the potential benefits and specific challenges to scale-up a local initiative. Box 5.3 below describes the case and scaling up process in more detail.

Box 5.3. Scaling up the Mayan Riviera Initiative to the VET system

The Mayan Riviera is one of the most important touristic destinations in Mexico. The region has undergone a dramatic transformation in the last decade or so, with the birth of numerous all-inclusive resorts and boutique hotels a testament to its flourishing tourist industry and thriving economic growth. Projections made by the Association of the Hospitality Sector in the region show that the sector is estimated to grow from 35 000 rooms in 2007 to 80 000 rooms in 2020. This increase puts a great deal of pressure on VET suppliers to provide the necessary training that this growing demand requires, both in terms of quantity and quality.

To satisfy this growing and more qualified labour demand, VET suppliers in the Mayan Riviera are aligning its training courses to the needs of the employers, becoming more responsive to industry needs. More precisely, after consulting local employers, the training centres in the region are changing the educational curricula pedagogy, providing new training, expanding the location and course schedules to adapt to the industry and employees' needs, and upskilling the trainers.

This initiative, which emerged from the dialogue between the local employers and the VET suppliers under the guidance and support of the Federal and State governments, is currently geographically circumscribed to the Mayan Riviera. However, a wider project has now been put in place due to the relative success of the initiative. It aims to replicate this experience in other touristic regions and in other economic sectors, such as automotive, with high growth potential.

To do so, an impact evaluation on the Maya Riviera project is underway. This evaluation will probably inform decisions as to whether to continue investing in training reforms of this kind. In addition to this project, other types of evaluations identifying not only the outcomes of the innovations but also the processes would provide valuable insights on lessons learnt about specific factors for success and for the transferability of the initiative to different contexts.

Mayan Riviera (Mexico) shows the importance of identifying the key elements that make an innovation successful and can help to identify and assess the potential of its scalability to other areas and sectors of the system. Although the scaling up of the initiative is still in progress, the role of evaluations for knowledge gathering about the outcomes and the process of the initiative were already highlighted. More precisely, in terms of potential scalability of the initiative, the role of context specific factors, such as the role of the employers or the favourable economic context, were identified as necessary for the success of the initiative. Moreover, the case also depicted the importance of counting on political support, guidance, and leadership to overcome potential barriers in the scaling up, such as the identification of appropriate industry counterparts and establishing necessary institutional arrangements between federal and state authorities.

In addition to bottom-up innovation, understanding and learning from the scaling up of pilot projects is also crucial. In our empirical study, many of the innovations analysed did not experience pilot testing or ulterior scaling up. On the contrary, they were directly applied system-wide.

There are different reasons why pilots were not used in many of the analysed cases. In general, piloting has a cost in terms of time and resources. Pilots require resources for their design and implementation, as a sample needs to be selected and its specific characteristics analysed in order to evaluate the results of the applied initiative. The process also requires time to be fully designed, implemented, and evaluated, and this represents a delay in the implementation of the initiative system-wide. These costs need to be compared and contrasted with the expected benefits accruing from these pilots. Many of the innovations reviewed in this project were incremental (see Chapter 7), and not aimed at achieving a radical alteration of the system. For most of these cases, the need for piloting was deemed unnecessary, especially

Box 5.4. The reform of Basic Commercial Training – Switzerland

Basic commercial training is a vocational pathway that annually prepares 30 000 young people to enter the job market in trade – and commerce-related occupations. In the late 1990s, the decision to reform basic commercial training came from the notion that firms perceived previous teaching methods to be too scholastic, and that students were not being trained according to their professional needs. As a result, a new basic commercial training programme was introduced aimed at allowing apprentices to understand the complexity of working processes in firms and to develop those skills necessary for future lifelong learning.

The implementation of the reform was carried out according to a simultaneous engineering process. This meant that new training provisions were simultaneously developed and tested as part of a broad-based, scientifically monitored pilot trial involving two cohorts. Participants included 12 of the 26 cantons, 16 vocational schools, and 15 different commerce sectors. Overall, approximately 2 000 people took part in the pilot, including apprentices. In 1998, as part of the test pilot, the first cohort, consisting of around 150 apprentices and their training firms, embarked on the new basic commercial training. A second cohort, comprising 750 apprentices in 400 companies, adopted the new training in 1999.

During these pilots, a number of implementation difficulties were revealed. The need to train and re-train thousands of trainers to adapt to the changes of the new programme was one of them. To resolve these difficulties, a task force including representatives for the Swiss Federation, the cantons, professionals' organizations, and a number of common interest group was created.

As the difficulties were progressively resolved, the full implementation of the programme took place, and since the summer of 2003 all first-year commercial courses throughout the country adopted the programme.

when compared with the projected associated cost and time. In other cases, the innovation itself could be regarded as a pilot (e.g. the *Innovation Circle* [Germany]), and therefore there was no need for piloting. In other cases, where substantial changes were expected to accrue, the urge to introduce the innovation immediately precluded the running of pilots. In these cases, however, some problems during the overall implementation arose, and this delayed the final process and took a toll on the final success of the innovation.

In the cases in which innovations were initially piloted before being implemented system-wide, the process revealed the importance of evaluating and understanding the specific characteristics of the environment where the pilot was tested. Box 5.4 introduces the example of the Reform of Basic Commercial Training in Switzerland, in which an interactive piloting system was used before introducing the reform in the whole system.

This example illustrates the importance of pilots in identifying barriers in the implementation of the innovation and designing alternative solutions. It also shows the importance of selecting similar groups to the population for the pilots or the need to take similarity into account when scaling the pilot to the overall system. In other words, it is necessary to bear in mind the specific characteristics of the pilots and to adapt the details of the implementations to the particular characteristics of other groups, or of the system, more broadly.

Conclusions and policy implications

This final section attempts to summarise some of the main empirical findings on the process of systemic innovation in VET systems – not a simple task given the complexity and interconnectedness of the themes explored. The section concludes with policy implications for systemic innovation derived from the analysis above.

Conclusions

The analysis of the process of systemic innovation reveals a number of issues regarding the role of stakeholders and the way that knowledge feeds into the stages of the process. Most of the systemic innovations in this study were initiated by governments from the top down. However, the way that in which initiators brought in other stakeholders during the design and development of the innovation varied largely, depending on the system and context. Some of the innovations from systems with a strong culture of consensus struggled to find the right balance between fully implicating all stakeholders and getting stuck at the lowest common denominator. The way that the knowledge base was used in the initiation stage varied widely. Explicit knowledge was not always taken into account, and in most cases it was observed that an urgent need for change and solutions to pressing problems, along with tacit knowledge, prompted the innovations.

A smooth implementation phase was often largely dependent on the clarity and foresight of the planning from the initiation phase. Stakeholders who had been invited to become actively involved tended to be more co-operative than those who had been involved in a more passive manner. Political leadership, adequate funding, and incentives proved instrumental in helping to facilitate smooth implementation of systemic innovations. The way that knowledge was used in the implementation also varied, with the farthest-reaching initiatives generally drawing the most on the knowledge base, depending on the nature of a given system. Communicating knowledge to stakeholders and users in the form of capacity-building proved crucial to smooth implementation and to avoiding implementation gaps.

Moreover, the current analysis of the monitoring and evaluation processes has revealed a number of important lessons for the analysis of systemic innovation. At present, *ex ante* and interim evaluations are still rather scarce, and seem to exist outside the policy process in the most innovative initiatives throughout most VET systems. In many cases, urgency for change and the novelty of a given approach may have precluded the use of these exercises. As a result, the valuable information that these exercises could deliver is missing. On the contrary, monitoring and *ex post* evaluations are normally planned and accepted as integral parts of the innovative process.

The empirical evidence also suggests that the importance and role of these exercises may depend on the importance and objectives of the innovations themselves. When the innovation does not seek deep or long-lasting effects in the VET system, the role of evaluation may be less in-depth in order to maintain a principle of proportionality. However, when the intended innovation seeks large-scale impact, these exercises become even more important for two reasons: first, because monitoring the actions undertaken and assessing whether those actions are achieving the intended goal is important; and second, exercises provide valuable information to all relevant stakeholders, whose commitment is crucial at all stages of the innovation, from the decision-making to the design and implementation. Both *ex ante* and interim evaluations also become more important for the same reasons, and the knowledge generated that spurs beyond the particular innovation could spill over to other systemic innovations.

The knowledge generated in the monitoring and evaluation exercises must feed back into the system to keep the learning process going and to capitalise from previous experiences.⁷ Mechanisms that ensure this policy learning are crucial, and time as well as both financial and human resources need to be assured for this purpose. At present, these mechanisms are not always properly defined in some VET systems.

As previously mentioned, the analysed empirical evidence, showing very few cases of bottom-up initiated systemic initiatives, suggests that the existing

VET systems may have difficulties identifying and scaling up discrete innovations. It is not always easy to identify the barriers that may prevent this process from happening, but more specific research could shed brighter light on it. However, a number of potential factors, such as the lack of dedicated institutions analysing systemic innovations, the unavailability of specific resources to test and experiment initiatives, lack of political attention to these initiatives, and the complexity of the governance system hindering knowledge transfer and learning across different authorities may contribute to it.

The one case study that followed a more bottom-up approach suggests that potentially there are substantial benefits to be gained from scaling geographically localised innovations. However, identifying the successful factors of the local initiative and transferring them to other locations may not be easy or resource-free. Planning and developing interim evaluations, assessing the processes of the particular innovations – including the relationship between the different agents – and using knowledge are encouraged. The sharing of knowledge from these evaluations also seems to play a crucial role. Pilots fulfil a crucial role in those systemic innovations that seek to deeply affect the system. While they are costly in terms of time and resources, they have proved vital in avoiding implementation problems and innovation fatigue. Their use should be encouraged, and their design and sample selection should bear in mind the characteristics of the context to ensure their future scalability.

Policy implications

This section suggests a number of policy implications that could help improve the innovative process of different initiatives. Although it is difficult to provide generally applicable concrete policy recommendations due to the importance of the contextual factors surrounding VET systems, the following can be regarded as a checklist for policy consideration. This section will start by highlighting the importance of stakeholder involvement and the crucial role of knowledge in the different phases of the innovation process:

- Create trust and build bridges within and between sectors and main stakeholders through transparency and communication throughout the stages of the process of systemic innovation, taking into account the different expectations of the key actors and sectors.
- Collaboration: find the right balance between fully implicating all of the various stakeholders in the system, which can be difficult to manage, and settling for the lowest common denominator, which can result in risk avoidance.
- Consider the available knowledge and evidence base when designing an innovation, as this can serve to guide the initiation and implementation phases.

- Identify factors and incentives that could help facilitate the implementation of the specific innovation and avoid implementation gaps, keeping in mind the specificities of the particular regional or national context.
- Communicate knowledge to stakeholders/users through capacity building, which is crucial to smooth implementation.
- Determine additional policy implications to ensure that both monitoring and evaluation enhance the design and implementation of future systemic innovations, to wit:
 - Evaluations should gather enough information to assess the degree to which innovations are achieving the intended goals, and be capable of feeding this knowledge into the policy process for the design of future innovations.
 - *Ex ante* evaluations, whenever possible, should be fostered during the design of any systemic innovation and before beginning its implementation. These *ex ante* evaluations could serve as a baseline to guide monitoring and final evaluation of the objectives achieved, as clear, measurable objectives and targets could be defined.
 - Monitoring should be an integral part of the innovation process and should be carried out at different moments of the implementation phase. The results of this process should be fed into the continued implementation of the innovation.
 - Interim evaluations can and should be encouraged not only to learn about possible barriers during the implementation but also to gain knowledge about the processes in place to assure a smooth implementation and successful outcomes.
 - Independent research centres for the monitoring and evaluation exercises should be used to ensure the impartiality and independence of the exercise. Moreover, a relevant range of stakeholders should be consulted to gain different insights, maintain a fair vision, and increase commitment and information about the innovation.
 - The necessary time and resources for proper monitoring and evaluation exercises should be foreseen prior to the implementation of the innovation. This may not be equally applicable for bottom-up or spontaneous innovations, as they may be less conducive to a formal planning exercise.
 - It is necessary to create and develop the necessary mechanisms/institutions that ensure the knowledge generated in the evaluation of specific systemic innovations is fed back into the system to assure policy-learning.

- Finally, in order to improve the introduction and use of pilots and render the process of scaling up discrete initiatives more efficient, additional policy implications can be suggested:
- Piloting of innovations is advisable in any systemic innovation, particularly those aiming to introduce radical changes into the system. Time and resources will be required.
- Carry out further research to understand the reasons for the lack of bottom-up innovations being scaled up, and to explore new avenues of collaboration.
- Devote human and financial resources to identifying and evaluating bottom-up innovation with the potential to be scaled up.
- Support better bottom-up innovations and create islands of experimentation and innovation.
- Create bridges over the different governance structures to facilitate communication and knowledge-sharing, enabling the diffusion of bottom-up initiatives.

Key messages

In developing an innovation, concerted efforts to find the right balance between fully implicating all stakeholders, which can be difficult to manage, and settling for the lowest common denominator, which can result in risk avoidance, are crucial.

Stakeholders invited to be actively involved early on in an innovation tend to be more cooperative and have greater sentiments of ownership throughout the process than those involved in a more passive manner or at later stages.

Communicating knowledge to stakeholders and users through capacity building is crucial to smooth implementation and avoiding implementation gaps.

Monitoring the implementation of the innovation is important to identify implementation gaps and design actions that overcome barriers to successful implementations.

Evaluating systemic innovation can be difficult as systemic innovations may aim at achieving a wide range of objectives that may be difficult to trace back to specific policies or activities. Nevertheless, evaluations are crucial not only to identify the results of the innovation but also to generate key knowledge to feed back the policy process and the identification of future innovation needs.

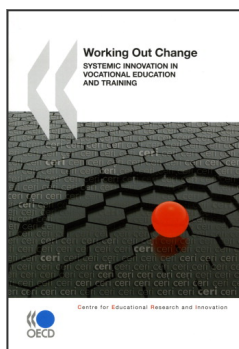
The use of pilots should be encouraged in order to identify potential implementation problems in large-scale deep impact innovations. However, many of the innovations analysed in the case studies did not experience a proper process of pilot testing and scaling up, and they were directly applied system-wide.

Notes

1. For more information, see the introduction to this study in Chapter 1.
2. For a more detailed discussion on the development of a model of innovation in education conceived for this study, see the final section of Chapter 3.
3. For a more in-depth discussion of conceptualizing the different forms of knowledge use in the context of systemic innovation in VET, see Chapter 6.
4. Loosely based on the research carried out by Von Hippel and others, the notion is that lead users have needs for innovations ahead of the general market, and play an important role in the innovation-decision process. A lead user develops an innovation and convinces a manufacturing company to produce and sell the innovation, after the lead user has created a prototype of the new product (Von Hippel *et al.*, 1999).
5. For a more in-depth discussion on innovation in education and innovation in vocational education and training, see the literature review in Chapter 3.
6. For a fuller discussion of these, see Chapter 4 on drivers of innovation.
7. Please see Chapter 6 for further information on this aspect.

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