Chapter 7

Towards a Typology of Systemic Innovation in VET

This chapter presents a new typology framework that aims to capture aspects of the process as well as the substance of systemic innovations in VET. The aim of this exercise was twofold: (i) *to map the case studies along certain important dimensions; and* (ii) *to serve as an analytical tool in the future for exploring some of the issues related to the processes and dynamics of systemic innovation. Three dimensions were considered important in the development of a holistic typology of systemic innovations: process, output, and contextual framework, each consisting of several variables. Using these three dimensions, as well as drawing on insights developed in the course of this study, a number of hypotheses are put forward regarding the possible types of systemic innovation in VET. In this context these are proposed merely as hypothetical types, and would need to be validated through empirical data in further research. Finally, the annex to the chapter presents a mapping of the fourteen cases studies along the variables of the typology frameworks.*

Introduction

This chapter explores issues around the development of a typology of systemic innovation in VET. The aim of this exercise was twofold: *(i)* descriptively, to help map the case studies; and *(ii)* analytically, to contribute to the generation of hypotheses regarding the initiation, development, and implementation of innovation initiatives in VET.

Chapter 2 discusses in some detail several typologies for innovation that have been proposed in the literature; these tend to focus on the following three dimensions:

- Area in which the innovation is applied or type of output

- Level of the innovation

- Impact produced

It is clear from this overview of the literature that the typologies proposed so far have largely focused on the substance rather than the processes or dynamics of innovation. In addition, the focus is on innovation rather than systemic innovation in the way it is defined and examined in the context of this study. As such, although some of the existing material available was useful for the purposes of this study, it also became clear that a new typology framework was necessary if process dimensions – the main analytical focus of the study – were also to be included. The work presented in this chapter tries to address this gap by bringing together elements of different typologies to arrive at a more comprehensive framework, capable of capturing aspects of both process and substance in systemic innovation.

The proposed framework for classifying the case studies used in this project consists of three dimensions: *(i)* output/level of innovation; *(ii)* process of innovation; and *(iii)* contextual factors. These three dimensions and their constituent variables are discussed in the main part of this chapter; Annex 7.A1 at the end of this chapter presents a tentative classification of the cases in terms of output/level and process as an illustration of how the typology can be applied to real cases of innovation.

A typology framework for systemic innovation in VET

Drawing to some extent on the existing literature, but also on insights and knowledge developed in the course of the present study, three dimensions were considered important in the development of a holistic typology of systemic innovations: *process*, *output* and *contextual framework*. Process is of course the focus of this study, so its inclusion in a typology framework for the case studies was considered essential. In addition, as pointed out

above, the lack of focus on process was a gap identified in the existing literature on innovation types. However, examining process in isolation was not meaningful. Firstly, the type of output may well have an impact on the process adopted (see below). Furthermore, it was considered useful to try to incorporate existing typologies on innovation outputs to make the proposed framework as comprehensive as possible. Both processes and outputs are, however, situated within and influenced by a host of contextual factors, such as the characteristics of a particular VET system or the governance structure of a country or region. A three-dimensional approach was therefore adopted to capture these additional elements.

Although it is assumed that these three dimensions are inter-related and interact with one another, at this stage no detailed description is provided of the way these relationships operate in practice, for two reasons: *(i)* this strand of work is still at an early stage in its development and needs to be further refined and tested in future research; *(ii)* the empirical evidence available as a result of the present study of systemic innovation is rather limited. No specific claims are therefore made here regarding the specific ways these three dimensions influence one another, and this question remains open for further investigation. For example, one possible hypothesis that could be explored in future research is that type of output and contextual framework act as explanatory variables for the types of process. In other words, it would be interesting to explore to what extent particular characteristics of processes (*e.g.* top-down innovations involving few stakeholders) tend to be associated with particular types of innovation, such as the introduction of a new curriculum, and particular contexts (*e.g.* countries with long-established, dual VET systems).

The three dimensions of the framework can be visualised as the triangle in Figure 7.1.

Each of these three dimensions consists of several variables, which are discussed in more detail in what follows.

Figure 7.1. **Dimensions of typology framework**
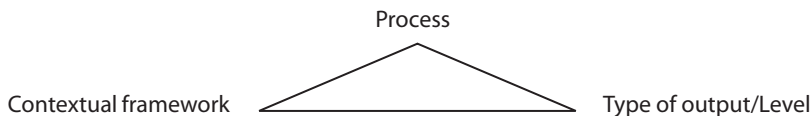
Output and level

This dimension refers to the output of the innovation. In operationalising this dimension, the existing literature on typologies was used extensively, as previously discussed. Specifically, two variables that seemed particularly pertinent in the context of educational innovations were focused on: *i*) the type of output the initiative sought, whether a new service or product, a new organisational method or a new marketing method; and *ii*) whether the innovation was radical or incremental.

As this aspect of the typology draws on existing work, existing definitions of the variables were used, drawing on the Oslo manual and the 2003 United Kingdom Strategy Unit paper, as outlined in Chapter 3; they are provided again here for ease of reference. The Oslo manual typology was developed with the business sector in mind, and so some of the terminology used does not apply directly to the VET or education sector (*e.g.* firms or packaging); however, it can still be meaningful in the context of this study. For example, new packaging could refer to new ways of presenting or communicating information. An equivalent to a business firm could be a training provider or a research organisation.

The first three variables refer to output types, the last two to the level of innovation:

- *New product/service*: The introduction of a good or service that is new or significantly improved with respect to its characteristics or intended uses (OECD and Eurostat, 2005).

- *New organisational method*: A new method of organising the firm's business practices, workplace organisation, or external relations. New organisational methods deal mainly with people and the organisation of work (OECD and Eurostat, 2005).

- *New marketing method*: A new marketing method involving significant changes in product design or packaging, product placement, product promotion, or pricing. It aims better to meet customer needs, open up new markets, or newly position a firm's product on the market (OECD and Eurostat, 2005).

- *Incremental*: Minor innovations to existing services, processes, or methods. On their own, they rarely change how organisations are structured or the relationships and dynamics within or between organisations. However, they form the majority of innovations and are essential to an organisation's pursuit of improvement (Mulgan and Albury, 2003).

- *Radical:* Innovations that involve new services or fundamentally new ways of organising or delivering a service (Mulgan and Albury, 2003).

Annex 7.A1 at the end of this chapter presents a mapping of the case studies according to the above variables.

Process

This second dimension refers to the process of innovation, and the variables identified below stem directly from the model of innovation in VET (see Chapter 3):

- *Top-down/bottom-up*: Refers normally to the initiation of the process of innovation. Examples of systemic innovations developed in a top-down fashion would include those developed by government or employer organisations. Bottom-up innovations in VET would include those developed by teachers, schools, or regional authorities.

- *Range and types of stakeholders involved*: The importance of the roles of different stakeholders within the process of innovation is discussed in Chapter 5. Important stakeholders may vary depending on the nature as well as the stage of any particular case (*e.g.* policy makers may not be important at the implementation stage of a classroom-level innovation). To operationalise this variable for the purposes of this typology, it was decided to define a core set of stakeholders and classify the cases according to whether this core set was consulted and involved in decision-making in the development and implementation phases of the initiative. Although this criterion may appear strict, it was considered necessary to proceed in this way to capture the variance found in the case studies given the rather small sample. Based on knowledge gained through the analysis of the case studies, the following groups of stakeholders were considered central in the VET sector, and therefore constitute the core set for the purposes of this typology: government (federal, regional, or local), social partners, trade unions, school leaders, and/or teachers.

- *Types of knowledge used*. This includes the following categories of knowledge:

  1. Academic or research, *i.e.* formal knowledge produced by academic researchers within universities or independent research institutes and disseminated through standard academic channels, such as peer-reviewed publications;

  2. Professional and/or practitioner knowledge, *i.e.* knowledge developed and shared by professionals or practitioners in the VET field, such as policy makers or teachers. This knowledge would typically be disseminated through policy papers or in practitioner journals;

3. Administrative data and statistics. Many countries, regions, or local authorities routinely collect information on enrolments, drop-out rates, qualifications completed, etc., and these data are sometimes used by external researchers or policy makers, for example when planning or evaluating initiatives. Some of our case studies draw on administrative data both at the initiation and evaluation stages;

4. Tacit knowledge. All three types of knowledge described above can be defined as explicit, *i.e.* formal, codified knowledge that is also often documented and that the learner is conscious of. Tacit knowledge, on the other hand, has been defined as "knowledge in the head", *i.e.* knowledge that individuals have – often without being aware of it – but that has not been codified or spelled out (see, for example, Polanyi, 1967).

• *Monitoring/evaluation*: Refers to whether a monitoring and/or evaluation process was planned or carried out. Although such processes can be of different types and their findings used in different ways, it was decided that for the purposes of the typology we only identify whether they were present or not in order to keep the framework as simple as possible. However, the analysis in subsequent chapters also focuses on the different types of monitoring and evaluation, as well as the extent to which findings and results were fed back into the process.

Contextual framework

In addition to examining the case studies themselves, a variety of factors external to the cases also need to be taken into account to form hypotheses regarding different aspects of the innovation process, such as the involvement of stakeholders or the way innovation is initiated or implemented. A process that may work in one country or region may not be as successful when implemented in another, and this may be due to factors such as the country's governance structure (for more on policy borrowing, see Phillips and Ochs, 2003; 2004).

It has been decided to call this group of variables the contextual framework, and ways in which they have been included in the analysis are discussed below.

The existing innovation literature could be used less when drawing the list of contextual factors, as it appears that this is the first time that a typology of educational or VET systemic innovations is being proposed. The members of the research team have instead drawn on their general knowledge of the VET sector, as well as on more specific information gained as a result

of the analytical work carried out in the context of the country visits. The list of contextual factors provided below may not be exhaustive; however, a balance had to be struck between being comprehensive and avoiding the inclusion of too many variables for the model to have any explanatory power. The contextual framework variables and their definitions used in the analysis are presented below:

- *Dual or non-dual VET system:* A dual VET system is one in which trainees receive part of their training while on the job in paid apprenticeships. Educational institutions, such as further education colleges, provide the rest of the training. Generally speaking, dual VET systems tend to have a longer tradition and enjoy a higher prestige than non-dual ones.

- *Importance of the VET system in the country*: VET systems are classified in terms of high or low importance, based on the proportion of the student population choosing a vocational path.

- *Governance system:* Refers to the governance structure of the country as a whole. Countries are distinguished depending on whether they have a federal or a non-federal system.

- *Existence of a consensus-building culture among relevant stakeholders:* Refers to the level of commitment to consultation and shared decision-making that exists among relevant stakeholders, such as government officials, social partners, and trade unions. Although a difficult concept to define and measure accurately, this commitment to consensus varies from one country and/or region to the other, and can easily affect the innovation process.

- *Level of commitment to innovation (innovation culture) within VET or education*. Evidence for this could be, for example, financial commitment to innovative approaches or the existence of specific units, departments, or institutes devoted to the study and implementation of innovative initiatives. However, the existence of the above could equally signal a lack of innovation capacity and an attempt to counter this, so one needs to be careful when referring to innovation culture as to whether it signifies either existing capacity or a commitment to encouraging or increasing innovation.

As stated earlier, many other contextual variables could be potentially relevant when examining the success or lack thereof of specific initiatives. These variables include a country or region's geography, demographic or economic characteristics, funding mechanisms available, and the existence of an accountability culture. The ones listed in bullet points above are those that were considered the most salient during the course of this study, particularly given the rather limited amount of empirical data gathered. In fact, mainly

due to this shortage of data, it was decided not to attempt a formal classification of countries or regions according to contextual factors similar to the ones presented above with regard to the first two dimensions (see Tables 7.A1.1 and 7.A1.2. in Annex 7.A1). It was judged that such an attempt would have been hasty and unwise, due to both the small number of countries involved in the study and the fact that the main focus of the data collection was on the cases themselves rather than on their contexts. Instead, the importance of these factors in the process of innovation is pointed out, and the factors are included in the analysis when necessary. Developing a more comprehensive typology framework that takes into account contextual variables in a more systematic way is one area in which further research is required.

Towards a general typology framework

Using the variables described above for the three dimensions of output/ level, process and context, as well as drawing on insights developed in the course of this study, a number of hypotheses may be put forward regarding the possible types of systemic innovation in VET. It is important to stress that at this stage these are proposed merely as hypothetical types, and would need to be validated through empirical data in further research. When possible, examples drawn from the case studies are used tentatively to illustrate particular types; however, given the limited number of the cases, there are several types that are not covered by the empirical evidence of this study. In addition, this is not an exhaustive list of possible types based on every possible combination of variables available. Instead, it is a selection that builds on knowledge developed during the course of the empirical phase of the study, and its use is intended to be exploratory rather than prescriptive.

Type I: This type would include initiatives that are radical rather than incremental, involve the development of a new product or service initiated in a top-down manner with the consultation of all or most stakeholders, draw on a wide range of knowledge sources, and include a formal monitoring and evaluation component. In other words, these are large-scale initiatives, often initiated by Governments, seeking to introduce a radically new product or service (*e.g.* a new curriculum). Due to their large scale and therefore possibly longer timeframes, these initiatives are more likely to involve all stakeholders, and make use of many available knowledge sources. An example of such an innovation from this study would be the *Flexible Learning Framework* (Australia).

Type II: This type would include radical, top-down innovations involving few groups of stakeholders, and drawing on little formal knowledge. This is therefore a rather authoritarian, non-inclusive model of innovation.

Type III: This type includes new organisational or marketing methods that may be radical or incremental, driven in a top-down way, involving a wide range of stakeholders, and drawing mostly or professional/practitioner knowledge, administrative data, and/or tacit knowledge. The *Globalisation Council* (Denmark) could be an example of such an innovation in this study.

Type IV: This type includes incremental, bottom-up driven innovations involving a small number of stakeholders and drawing on a limited amount of knowledge, most often professional/practitioner or tacit, and has no systematic monitoring or evaluation or scaling up.

Type V: This type includes radical or incremental, bottom-up driven innovations involving a large number of stakeholders, drawing on formal knowledge, such as academic literature and including a systematic evaluation component that often leads to a scale-up. The *Playa de Carmen* (Mexico) case study is an example of such an innovation.

A number of hypotheses could be developed and tested through empirical research regarding issues such as the chances of success of different types of innovation given particular contextual factors. For example, it would be interesting to investigate whether Type I and II innovations are more likely to take place and be successful in systems that are centralised in terms of governance, and in which a high level of commitment to innovation is indicated through the presence of specific funding streams and institutional structures for increasing innovative capacity. Similarly, decentralised systems may be more open to bottom-up innovations, although the extent to which such innovations are successfully evaluated and scaled up may depend on variables such as co-operation among stakeholders.

Conclusions and policy implications

This chapter presented a new typology that aims to capture aspects of the *process* as well as the substance of innovations in VET. As the process was the focus of this study and the existing literature did not provide any suitable models, it was considered essential to provide a first attempt at developing such a tool, both for the purposes of the current study and for future research. The framework as presented here has limitations, many of which were discussed at length in this chapter. One major shortcoming is the limited empirical base available for testing it more thoroughly. A larger and more diverse group of cases would have provided more evidence in support for or against it. Nevertheless, it is hoped that it serves as both a useful way of mapping the case studies along certain important dimensions and a useful analytical tool in the future for exploring some of the issues related to the processes and dynamics of systemic innovation along the lines outlined above.

Key messages

A new typology framework is presented that aims to capture aspects of the process as well as the substance of systemic innovations in VET.

The proposed typology consists of three inter-related dimensions: process, output and contextual framework. Each of these dimensions includes a number of different variables.

The variables that make up the process dimension stem directly from the model of systemic innovation described in Chapter 3. They are: bottom/up vs. top-down imitation, range and types of stakeholders involved, types of knowledge used and the presence or not of monitoring and evaluation.

A mapping of the 14 systemic innovation cases examined in this study following the typology framework is presented in the Annex of the chapter.

References

Mulgan, G. and D. Albury (2003), *Innovation in the Public Sector*, Working Paper Version 1.9, Strategy Unit, UK Cabinet Office, London.

OECD and Eurostat (2005), *Oslo Manual. Guidelines for collecting and interpreting technological innovation data*, OECD Publishing, Paris.

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Annex 7.A1

Typology of Case Studies

Table 7.A1.1 below presents the case studies by type of output, following the framework discussed in this chapter. An explanation of the abbreviations used to refer to the cases is given in Annex 7.A2.

Table 7.A1.1. **Classification of case studies by output and level of innovation**

Cases	New product/service		New organisational method		New marketing method	
	Radical	Incremental	Radical	Incremental	Radical	Incremental
AUS1		X				
AUS2		X				
AUS3						X
CH1		X				
CH2		X				
CH3		X				
DK1				X		
DK2						X
GER1				X		
GER2				X		
HUN1		X				
HUN2		X				
MEX1		X				
MEX2				X		

The majority of the case studies involved a new product or service, while a few involved new organisational or marketing methods. Although this is a small sample of cases, which may not even be representative of innovation

initiatives in the six participating countries or more widely within the OECD member states, it is interesting that there were not more initiatives within the new marketing method category, given that a widespread concern regarding VET among governments is its perceived lack of prestige and parity of esteem compared with more academic qualifications. In terms of the level of innovation, whether radical or incremental, the case studies are split almost equally. In addition, there does not seem to be a clear pattern in the way the two variables interact, as it does not appear that a particular type of innovation is more likely to be radical or incremental – although there are no radical new marketing method cases, the existence of only two marketing method cases makes it difficult to draw any reliable conclusions.

Table 7.A1.2 presents a classification of the case studies following the process framework discussed above.

It is clear from the table above that no salient pattern emerges with regard to the different variables or how they interact with one another, but given the limited number of cases available this may not be surprising. However, it is interesting that, with the exception of the top-down *vs*. bottom-up variable, there is a large variance in the configuration of cases with respect to the different categories. This could be an indication that the model is – at least partially – successful in capturing the different aspects of the innovation process, although in the future some of the variables may need further elaboration as well as more rigorous empirical testing through a larger and more varied sample of cases.

The vast majority of cases used in the study were initiated in a top-down manner, with only two examples of bottom-up innovations, the *Reform of Basic Commercial Training* (CH2) and the *Playa de Carmen* project (MEX2). Categorising a case as top-down or bottom-up is not always a straightforward process; in some cases the boundaries between the two are not clear, either due to lack of relevant information or because the roles of different stakeholders are not clearly defined. An example of such as a case was the *SKOLA* study (GER2); although this was a project developed by academic researchers and teachers and implemented in a small number of colleges in a few German *Länder*, it was initially driven through the availability of a regional funding scheme. It was therefore decided that in terms of initiation it was led by the regional government in a top-down manner, although a large part of it originated in and was led by local end-users such as college teachers.

The way cases were selected for this study may have also led to a rather biased over-representation of top-down initiatives, as the selection was done by government officials in participating countries who inevitably may not always be familiar with smaller-scale, bottom-up projects. In addition, systemic innovations are probably more likely to be top-down, given that their scope encompasses by definition multiple components of a system. However,

it is certain that such initiatives exist in the field of VET, as discussed in the review presented in Chapter 3, and one of the challenges in the field may be finding ways of addressing this fragmentation and ensuring that lessons learnt or findings from one project can be disseminated and/or scaled up.

Table 7.A1.2. **Classification of case studies by process**

Cases	Top-down or bottom-up	Involvement of core set of stakeholders during development and implementation	Type of knowledge used during initiation and development	Monitoring and/or evaluation
AUS1	TD	N	Academic/research	Y
AUS2	TD	Y	Professional/practitioner Administrative data/statistics	Y
AUS3	TD	N	Professional/practitioner Administrative data/statistics Tacit	N
CH1	TD	N	Administrative data/statistics Tacit	Y (planned)
CH2	BU	Y	Professional/practitioner	Y (embedded)
CH3	TD	N	Academic/research	Y (planned)
DK1	TD	Y	Academic/research Professional/practitioner Tacit	Y
DK2	TD	Y	Administrative data/statistics Tacit	Y
GER1	TD	Y	Professional/practitioner Administrative data/statistics	N
GER2	TD	N	Academic/research Professional/practitioner Tacit	N
HUN1	TD	Y	Professional/practitioner Administrative data/statistics	Y
HUN2	TD	Y	Professional/practitioner Administrative data/statistics Tacit	Y
MEX1	TD	N	Professional/practitioner Academic/research	N
MEX2	BU	Y	Administrative data/statistics	N

Although in most cases a core set of stakeholders was involved, there were still a few in which it was judged that this was not the case. Once more, the decision on how to classify each case was not simple and straightforward. Firstly, the stakeholders that could be considered essential may vary from case to case; for example, the importance of the role of VET students may vary depending on whether the case in question is a classroom-based intervention or the introduction of a new national curriculum. The set of stakeholders defined here as core was decided upon to provide a certain level of abstraction needed in the model. In addition, this is an area in which the contextual factors discussed above can be very important. Specifically, the extent to which decisions are a result of negotiation and based on a consensus among all stakeholder groups varies with a particular country or region's political and social context or history.

The 14 case studies vary widely in terms of the type, or combination of types, of knowledge used. In fact, this is the one variable for which there is the largest amount of variance among cases, signalling the knowledge base's important role in the process of innovation as well as its ability to draw on a variety of sources irrespective of other factors, such as the type of output or whether it is top-down or bottom-up. Issues and questions related to the use of the knowledge base in the process of systemic innovation are discussed in more detail in Chapter 6.

Although the majority of cases included a monitoring and/or evaluation component, a rather surprisingly large minority (three) did not. Further, there were instances of case studies in which the evaluation component, although present, was not of the highest standards – (see also Chapters 5 and 6). As many of the cases studied had not been completed at the time of the study visits, those with a planned evaluation component were also taken into account, although it is difficult to judge how successfully such evaluations may be carried out. Once more, an adequate monitoring and evaluation process needs to fit the aims and characteristics of the innovation at hand, and also to ensure that any results are fed back into the process and thereby inform a potential scale-up or other future initiative. In other words, having an evaluation component in place is not in itself sufficient, but it is a necessary condition for the process of innovation; the model above attempted to reflect this. The use of monitoring and evaluation is discussed further in Chapter 5.

Annex 7.A2

Abbreviations for Case Studies

GER1	Innovation Circle
GER2	SKOLA
DK1	Globalisation Council
DK2	Reduction of number of school-based places
AUS1	NCVER
AUS2	Flexible learning framework
AUS3	Raising the status of VET
HUN1	NVQR
HUN2	Step One Forward
CH1	Case Management
CH2	Commercial training reform
CH3	Leading Houses
MEX1	Technical Baccalaureate reform
MEX2	Playa de Carmen