

Chapter 1

Introduction

This report presents the main findings of the OECD Centre for Educational Research and Innovation (CERI) project on Systemic Innovation in Vocational Education and Training (VET). The project was undertaken during 2007 and 2008 as part of a wider CERI commitment to research systemic innovation, which also included a sister project on Digital Learning Resources as Systemic Innovation.¹ Additionally, the Education and Training Policy Division of the OECD Directorate for Education has carried out a policy review on VET, whose first phase has produced a report entitled *Learning for Jobs*.² Both parallel strands of work have to be considered responses to the request made by OECD member states to emphasise the VET sector.

The CERI project benefited from the active participation of the following countries: Australia, Denmark, Germany, Hungary, Mexico, and Switzerland. Each of these countries completed a questionnaire on innovation in VET, provided a background report for the cases (now available online from the project website³), and organised a series of visits to provide empirical evidence to nurture the project, which is based on a select number of case studies.

Context: why research systemic innovation in VET?

The main aim of this study has been to analyse the process of innovation in education. To this purpose, systemic innovation was defined as any dynamic system-wide change intended to add value to the educational processes. Particular attention was given to how countries initiate innovation, the processes involved, the role of drivers and barriers, the relationships between main actors, the knowledge base being drawn on, and the procedures and criteria for assessing progress and outcomes.

Although the management of change within complex systems is a key challenge to educational policy makers, the dynamics of innovation in education remain to be fully understood. So far, not much comparative analytical attention has been devoted to the policies related to educational innovation, the knowledge base on which they draw, and their ultimate effectiveness.

It is important to acknowledge that the project was designed and developed well before the emergence of the current economic crisis. However, key messages and policy implications have been elaborated in view of the current circumstances and needs, where possible.

As one of the first attempts to analyse innovation in a particular education sector from a systemic perspective to better understand how education systems approaches innovation, this work has been breaking new ground in many respects. More specifically, it looks at how innovations are generated and diffused in the system, to what extent knowledge is the basis of these innovations, how knowledge circulates throughout the process, and how stakeholders interact to generate and benefit from this knowledge. Work from other fields, including both the public and private sectors, provided a solid basis for reflection and analysis. The aim was to better understand the process of innovation and facilitate the policy process involved in promoting, sustaining, assessing, and scaling up innovations.

For this purpose, the adoption of a knowledge management perspective was appropriate and extremely useful. Such a perspective, previously used by CERI in the area of educational research and development,⁴ emphasises how knowledge is produced, shared and disseminated, and effectively used in any decision-making process, whether in policy making or professional practice. Again, it should be stressed that this may be the first time that such an approach has been applied to the analysis of systemic innovation and represents a first step in a promising analytical field.

In addition, the analysis of innovation from a systemic perspective has been extremely limited within the VET field. Analyses of innovation in VET that go beyond particular case studies of institutional or discrete initiatives tend to focus either on the links between new technological developments in a particular economic sector and the resulting demands for VET, or on the promotion of the innovative spirit that usually accompanies an entrepreneurial approach to labour opportunities.

Research questions

Although there exists an increasing interest in the role played by research evidence in policy formation in education, not enough is known about the connections among research findings, public policies, and educational

innovations. Previous CERI work on knowledge management, on educational R&D, and particularly on evidence-based policy research (OECD, 2004; OECD, 2007) points to the current difficulties experienced when trying to align these three elements.

The systemic analysis of innovation in education provides another opportunity to continue and refine the work carried out so far, paying particular attention to the connections between evidence and innovation processes in education. In particular, this project has worked to answer the following research questions:

- What was the process for identifying key areas for innovation, and who was involved?
- How were bridges between stakeholders brokered to allow for exchange of knowledge and practice?
- What were the principal knowledge sources and types drawn on in preparing the innovation?
- How was the process of innovation development implemented?
- How was the process scaled up (e.g. scaled from local to national/regional level)?
- What criteria were used to evaluate the innovation, and how were they applied?
- What were the positive and negative lessons learnt, with respect to both processes and outcomes?

Sharing experience in this way could shed light on the comparative strengths and weaknesses of different systems and policy approaches, in particular:

- the connections between research evidence and innovation policies in education;
- the extent to which innovation policies in education are driven from the centre;
- the openness of education systems to bottom-up innovation;
- the channels through which innovation policies are developed and implemented;
- the time horizons adopted for implementation; and
- the ways in which monitoring and evaluation are carried out, and the roles played by stakeholders in different education system configurations.

The systemic approach includes the reflection on “innovation fatigue”, or the pace at which successive innovations can be effectively and iteratively implemented. Sharing experience in this way could also shed light on the experiences and roles of other stakeholders in fostering innovation in the VET system (e.g. industry, small and medium-sized enterprises, and/or teacher unions) and the dynamic interaction between so-called “top-down” and “bottom-up” approaches to innovation.

Generally speaking, the systemic approach to innovation applied to VET can provide constructive insights into a broader perspective of innovation systems and policies in education as well as a basis for further research in this area, particularly regarding the connections between research evidence and innovation in education. In particular, work on systemic innovation in the VET sector offers major opportunities to investigate:

- *Competing concepts of innovation* in VET: how is innovation defined and understood in different VET systems? Why should innovation in VET systems be fostered?
- *The dynamics of innovation* in VET from a knowledge management perspective: what are the main models of innovation in VET in OECD countries? What are the systemic factors involved?
- *Innovation policies* in VET: from the perspective of evidence-based policy research, how are innovation policies designed? What is the role of research evidence in nurturing innovation policies? How are these policies monitored and evaluated?
- *Innovation indicators* in VET: can innovation in VET be operationalised and accounted for? What would a system of indicators in this area look like? Would benchmarking countries and monitoring progress over time prove ultimately useful?

Methodology

The project had three phases: (i) analytical, (ii) empirical and (iii) comparative.

The development of the analytical strand started with a stock-taking exercise that brought together not only relevant lessons from earlier work, specifically the CERI work on Knowledge Management, Educational R&D, and Evidence-based Policy Research (OECD, 2004; OECD, 2007), but also other activities, such as *Schooling for Tomorrow*,⁵ in which there have been found direct links to Innovation Units and similar bodies in several member countries. It also took into account similar work done at the OECD in the field of innovation policies in health as well as in science and technology.

This stock-taking exercise was supplemented with an expert meeting on conceptual and methodological issues, for which a number of expert papers were commissioned. The focus of the empirical strand was a series of case studies (see Box 1.1).

Given the exploratory and ground breaking nature of this work and the lack of other relevant work in the area, the methodological approach adopted was based on case studies to test the initial assumptions and to generate a first map of both the interplay between drivers and barriers and the interactions among stakeholders. The choice of cases turned out to be helpful in this respect because it provided a manageable set of factors and variables for analysis.

Although the case studies analysed form a significant set of empirical evidence both in number and in scope, future work on systemic innovation would require a larger evidence base. In particular, we recommend that the case study approach be supplemented with other methodological strategies to better capture the dynamics of innovation at system level.

Box 1.1. Case studies developed

The case studies covered a variety of areas, ranging from the promotion of research on VET (e.g. *Leading Houses*, Switzerland; *Building a research and statistical evidence base for VET*, Australia), to the development of new tools (e.g. *Flexible Learning Framework*, Australia; *Self-regulated and cooperative learning in VET*, Germany), to the establishment of specific bodies involving various stakeholders aimed at improving VET (e.g. *Innovation Circle on VET*, Germany; *Follow-up on the Globalisation Council's recommendations for VET*, Denmark).

The innovations described in the studies also varied greatly in their regional coverage. Some of the case studies presented innovations implemented in a particular region (e.g. *Linking public and private resources to improve worker preparation and training in the Mayan Riviera*, Mexico), while others affected the entire national VET system (e.g. *Preparing process of the new modular National Vocational Qualification Register*, Hungary; *Technical Baccaulaureate Reform*, Mexico).

The case studies also covered a variety of VET sectors and forms of delivery. Some initiatives were targeted at a particular sector such as adult training (“*Step one forward*”, a programme providing financial support to train low-skilled adults, Hungary) or school-based secondary VET (e.g. *Technical Baccaulaureate Reform*, Mexico). Some case studies focus on a particular method of delivery, such as e-learning (*Flexible Learning Framework*, Australia, that aims to improve the e-learning infrastructure), while others deal with the whole VET system (*Building a research and statistical evidence base for VET*, Australia).

Table 1.1 gives a brief overview of all the case studies for reference purposes. For an in-depth analysis and discussion of all cases see the country reports available on the study's website www.oecd.org/edu/systemicinnovation.

Table 1.1. **Overview of case studies**

Country	Title of the case study
Australia	<i>Increasing the status of VET</i> The Joint National VET Communications Project which is undertaking new baseline research into people's attitudes and knowledge about VET
	<i>Australian Flexible Learning Framework</i> A collaboration between the Australian Government and the eight state and territories for supporting and leading the growth of e-learning across the VET system
	<i>National Centre for Vocational Education Research (NCVER)</i> A centre for building a research and statistical evidence base for Australian VET
Denmark	<i>Globalisation Council</i> Follow-up to the Globalisation Council's recommendations for a VET system fit for the future with a special focus on improving completion rates and reducing drop-out
	<i>Initiatives for increasing the number of company-based training places</i> Outcomes of the 2002/03 initiatives on more practical training places and less school based practical training
Germany	<i>Innovation Circle on Vocational Education and Training</i> Ministerial initiative for improving the structures and interfaces of VET and enabling education policy to adapt to new demographic, economic, technological and international developments at an early stage.
	<i>SKOLA</i> A research project studying the concept of self-regulated learning in the context of VET, advising VET practitioners on the successful implementation of self-regulated learning in practice and examining its effects.
Hungary	<i>National Vocational Qualification Register</i> A revisions of the NVQR using a modular and competency-based framework
	<i>"Step one forward"</i> A programme for helping low-skilled, unemployed adults acquire marketable qualifications.
Mexico	<i>Technical Baccalaureate Reform</i> A 2004 reform that resulted in substantial changes in VET and gave way to larger reforms in secondary education in Mexico in 2007.
	<i>Playa del Carmen Project</i> Linking public and private resources to improve worker preparation and training in the Mayan Riviera

Table 1.1. **Overview of case studies** (*continued*)

Country	Title of the case study
Switzerland	<p><i>Case Management</i> Introduction of a case management model to aid the transition to post-compulsory education of academically weak and disadvantaged students.</p> <p><i>Leading Houses</i> Research networks on different areas of VET based around one or several University chairs.</p> <p><i>Reform of basic commercial training</i> Reform of basic commercial training at upper-secondary level covering 26 specialities such as retail, banking and public administration.</p>

Countries were responsible for providing background information about each of the cases as well as about innovation policies in the VET sector. This background information was used as the main starting point for the international experts and OECD secretariat, who conducted the corresponding country visits (see Table 1.2).

Each participating country submitted for examination two or three case studies of VET systemic innovations. These cover a variety of areas, ranging from the promotion of research on VET (*e.g. Leading Houses* [Switzerland]), the building of research and statistical evidence base for VET (*e.g. NCVER* [Australia]), the development of new tools (*e.g. Flexible Learning Framework*

Table 1.2. **Country visits**

Country	Dates	Secretariat	Experts
Denmark	25-29/2/08	Katerina Ananiadou	Marita Aho (Finland) Tom Schuller (UK)
Hungary	17-20/03/08	Tracey Burns Viktoria Kis	Jordi Planas (Spain) Berno Stoffel (Switzerland)
Australia	7-14/04/08	Tracey Burns	Hanne Shapiro (Denmark) Lorna Unwin (UK)
Switzerland	28-30/04/08	Francesc Pedró Tracey Burns Katerina Ananiadou ⁶	Henri de Navacelle (France)
Germany	8-12/09/08	Katerina Ananiadou	Hanne Shapiro (Denmark) Berno Stoffel (Switzerland)
Mexico	11-19/11/08	Beñat Bilbao-Osorio Vanessa Shadoian-Gersing	Hanne Shapiro (Denmark) Manuel Souto (UK)

(Australia) and *SKOLA* [Germany]), to the establishment of specific bodies involving various stakeholders aiming to improve VET (e.g. *Innovation Circle* [Germany] and *Globalisation Council* [Denmark]).

The innovations described in the studies also vary greatly in their regional coverage. Some of the case studies present innovations implemented in a particular region (e.g. *Mayan Riviera* [Mexico]), while others affect the entire national VET system (e.g. *National Vocational Qualification Register* [Hungary] and *Technical Baccalaureate Reform* [Mexico]).

The case studies also cover a variety of VET sectors and forms of delivery. Some initiatives are targeted at a particular sector such as adult training (e.g. *Step One Forward* [Hungary], a programme providing financial support to train low-skilled adults) and school-based secondary VET (e.g. *Technical Baccalaureate Reform* [Mexico]). Some case studies focus on a particular way of delivery, such as e-learning (e.g. *Flexible Learning Framework* [Australia], which aims to improve the e-learning infrastructure), whereas other innovations affect the entire VET system (e.g. *NCVER* [Australia]).

A small team of international experts in the field of VET, accompanied by one or two members of the OECD/CERI Secretariat, visited each of the participating countries for a series of meetings with stakeholders involved in the case studies. The information gathered from these meetings formed the basis of a series of country reports on Systemic Innovation in VET, available on the project's website: www.oecd.org/edu/systemicinnovation.

The last phase of the project was the comparative analysis of cases on the basis of the initial analytical and conceptual framework. The main findings and policy implications resulting from it are presented in the following pages.

Scope and content of this report

In addition to this introduction (Part I), the report consists of the following three parts: (i) analytical background, (ii) empirical and comparative evidence, and (iii) conclusions and recommendations.

Part II presents a full account of the conceptual and analytical background developed and used throughout the development of the project. It pays particular attention to the definitions of critical concepts, such as innovation, reform, and systemic innovation, all of which are inherently elusive. It also presents the results of the stock-taking exercise of the previous OECD work on innovation, and discusses what can be learnt from areas such as innovation in public services and social innovation. A full chapter (Chapter 3) is devoted to the discussion of systemic innovation in education. This chapter is crucial, as it presents and justifies the model of innovation in education that was used during the empirical phase of the study and therefore throughout this report.

It also attempts to apply the model to the VET sector. It is intended to address two main issues: the specific characteristics of VET that differentiate it from other education sectors and whether innovation in VET follows the same rationale as innovation in education.

Part III forms the largest part of this report. In this section we present the study's empirical and comparative work, focusing primarily on three issues: (i) the combination of drivers and barriers of systemic innovation in VET that emerge from the different cases, examined in Chapter 4; (ii) the process and dynamics of systemic innovation, the theme of Chapter 5, wherein the various stages that constitute the model of innovation used in this project are discussed in light of the empirical evidence: initiation, implementation, monitoring and evaluation, and scaling up; and, finally, Chapter 6 focuses on (iii) the use of the existing knowledge base in systemic innovation in VET, which is linked to the broader question regarding the use of evidence in policy making. As a result of the analytical work, this part of the report also includes a chapter on typologies of processes of innovation in VET (Chapter 7).

Part IV deals with conclusions and policy recommendations, as well as the pending research agenda. The first chapter (Chapter 8) discusses the evidence emerging from the case studies related to government policies and systemic innovation in VET, while introducing the issue of the advantages and shortcomings of innovation policies in VET. The following chapter (Chapter 9) presents the pending research questions that this project has unveiled, while introducing new and crucial areas, such as the measurement of innovation or the connections between systemic innovation and research in VET. Areas and issues as complex as these should be tackled in the context of the OECD Innovation Strategy.⁷ The last chapter (Chapter 11) wraps up the main findings and conclusions from the empirical evidence and elaborates a comprehensive set of policy recommendations for the design, implementation, monitoring and evaluation of systemic innovations in VET.

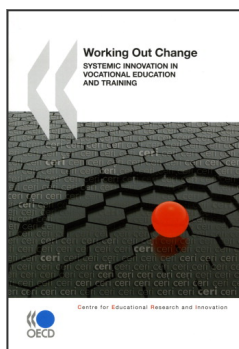
Needless to say, this report presents the results of what is primarily an exploratory exercise on systemic innovation in VET, and to some extent in education in the largest sense. It is very likely that the reader will be frequently reminded of the exploratory character of this project, particularly when realizing that the questions posed outnumber the responses emerging from the study's empirical findings. This fact reveals both the greatness and the shortcomings of exploratory research, and we believe that this study will have served its purpose if it succeeds in making policy makers aware of the need to address issues of systemic innovation in VET by drawing more on evidence, while fostering further, and much needed, research.

Notes

1. More on this at www.oecd.org/edu/dlr.
2. See www.oecd.org/document/42/0,3343,en_2649_33723_40344106_1_1_1_1,00.html.
3. More on this at www.oecd.org/edu/systemicinnovation.
4. The definitions of research and development used then are also applied throughout this report. *Research* is defined as the process of knowledge creation that conforms to the agreed scholarly standards intended to warrant its validity and trustworthiness. In this report, *basic research* is differentiated from *applied research*. The former is driven by curiosity and an inherent interest in a phenomenon or problem, while the latter is consciously designed to solve a problem in policy or practice. In both cases, the process of knowledge creation is carried out within the framework of a theory, which might be either validated or challenged by new research. *Development* is defined as any form of knowledge creation designed to improve practice. Thus, the main purpose of development is to facilitate change in a particular context. A number of educational developments are teacher-led activities and consist of *enquiry-based activities* that take place within schemes for the professional development of teachers. More at: www.oecd.org/edu/rd.
5. More on this at www.oecd.org/edu/cei.
6. Due to the unexpected illness of an external expert the team for this visit consisted of three Secretariat members and one external expert instead of the usual arrangement of one/two Secretariat member and two experts.
7. For more details see www.oecd.org/innovation/strategy.

References

- OECD (2004), *Innovation in the Knowledge Economy: Implications for Education and Learning*, OECD Publishing, Paris.
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