

**OECD/CERI STUDY OF SYSTEMIC
INNOVATION IN VET**

Systemic Innovation in the Danish VET System
Country Case Study Report

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1. Introduction

This is the first in a series of country reports prepared as part of the study on Systemic Innovation in Vocational Education and Training (VET) being conducted by CERI/OECD during 2007-08. It focuses on two recent case studies of systemic innovation in the Danish VET system and draws on: i) background information provided by Danish officials on the two case studies and ii) meetings and interviews conducted during a study visit to Denmark that took place on 25-29 February 2008. The visiting team consisted of Marita Aho, Senior Adviser at the Confederation of Finnish Industries, Tom Schuller, Director of the Inquiry into Lifelong Learning, NIACE, UK and Katerina Ananiadou, analyst at the OECD/CERI Secretariat. During the visit the team met with thirty stakeholders involved in one or both of the case studies of Systemic Innovation in VET selected by the national coordinators for detailed study in the context of the project. A complete list of participants' details is given in Annex 1.

The overall aim of the study is to examine systemic innovation in VET. The definition of systemic innovation adopted here is: *any kind of dynamic, system-wide change that is intended to add value to the educational processes and outcomes*. The aim is to analyse innovation systems and strategies in VET by bringing together evidence of the drivers for systemic innovation in six different countries.¹ All countries participating in the study have selected two or three case studies of recent innovations in VET for in-depth analysis by the expert team. The following is a list of issues that the study focuses on in particular:

- How countries go about innovation
- The processes involved, leadership and the relationships between the main actors
- The knowledge base that is drawn on
- The procedures and criteria for assessing progress and outcomes

This introductory section provides a brief overview of the Danish VET system followed by a short description of the two case studies selected for the study. As these form the main focus of this report they are described and discussed in more depth in later sections of the report. The two cases were selected by Danish officials, in collaboration with the OECD/CERI Secretariat, as they formed the basis of some of the most important changes in VET in recent years.

¹ Australia, Denmark, Germany, Hungary, Mexico and Switzerland.

1.1. The Danish VET system

The Danish VET system has as its overall principles to provide trainees with vocational qualifications that are formally recognised and in demand by the labour market, but also with general and personal qualifications that will equip young people for lifelong learning and active citizenship.²

It is based on three main principles:

1. The dual training principle, *i.e.* periods in school alternating with periods of training in an enterprise;
2. The principle of social partner involvement, whereby the social partners take part in the overall decision-making and daily running of the VET system;
3. The principle of lifelong learning. This is achieved through the system's flexibility which allows trainees the possibility of taking part of a qualification at a given moment and later returning to the system and adding to their VET qualifications in order to access further and higher education. Initial and continuing VET are carefully co-ordinated to ensure coherence between different qualifications and competence levels.

The government sets out the overall framework for vocational education and training; within this framework the social partners decide on the content of VET courses. Colleges are financed by the state according to a 'taximeter' system: financial support is generated for every student that enrolls on a programme. The Ministry of Education, in cooperation with the social partners, determines all standards in the form of regulations; there is no regional level in the system, only national and local ones.

The dual-training principle is both a pedagogical principle and an organisational-institutional one. There are two access routes to the VET programme: the school pathway and the company pathway. Trainees can either enrol on a basic course or start in a company with which they have a training contract. In both cases, school periods (approx. 1/3 of the time) alternate with periods of in-company training (approx. 2/3 of the time).

VET programmes are divided into two parts: a basic course, which is broad in scope, and a main course in which the trainee specialises in an occupation. Following the most recent reforms, there are twelve basic courses. Once the basic course is completed trainees apply for

² National Education Authority, Danish Ministry of Education (2005), *The Danish Vocational Education and Training System*, Danish Ministry of Education, Department for Vocational Education and Training, Copenhagen.

apprenticeships with an employer. The trainee and the employer enter into a binding contract and the trainee receives wages according to the collective agreement within the sector. During school periods the employer receives compensation from the Employers Reimbursement Scheme which was set up by law in 1977 and is financed by contributions from all employers. A training contract with an employer is required for progression into the main VET course which normally lasts 3-3 1/2 years.

The Ministry acknowledges that there is sometimes a mismatch between the supply and demand of apprenticeships within the Danish VET system, as many employers do not employ trainees because they consider them a liability. Trainees who do not have a training contract show little mobility as they can continue their training within the compensatory practical training scheme. However, the number of trainees admitted to this scheme was reduced in January 2005 in programmes that were too popular or where subsequent chances of employment were limited (see Case Study 2 below).

Trainees can also enrol on shorter programmes or programmes leading to partial qualifications, thus adding flexibility to the system. The issue of increased flexibility has also been the focus of one of the recent reforms, described below.

1.2. Innovation in the VET system

Several initiatives have been implemented in order to support and improve innovation in VET in Denmark. These include: the setting up of a central fund for supporting analyses and projections related to new emerging fields and occupations and giving power to the Ministry of Education to initiate new education programmes covering trades or occupations not covered by the trade boards.

Quality standards are maintained through legislation that requires openness and transparency according to which all educational institutions are required to present evidence on the quality of their programmes on their webpage. This evidence is subsequently scrutinised by ministry officials and appropriate action is taken if necessary.

In terms of using relevant evidence when initiating innovations, the Ministry has strong cooperation links with a national network of researchers on VET issues, who, in turn, form parts of international research networks. When identifying key areas of innovation a two-level process was used: the national Globalisation Council (chaired by the Prime Minister) identified the overriding challenges and a committee including all relevant VET stakeholders came up with concrete recommendations. Relevant stakeholders included employers, labour union representatives, heads of

institutions, teacher and student representatives and researchers interested in VET – see Case Study 1 below.

In order to encourage bottom-up innovations, there is support for development projects and other initiatives. An example of such a project is the one discussed in Section 2.3 below whereby municipalities have received funding in order to carry out small-scale projects to investigate ways for achieving the 95% completion target.

Evaluation of innovations is carried out by the National Evaluation Institute, often complemented by independent researchers and expert teams.

1.3. Case Study 1: Follow-up to the Globalisation Council's recommendations for a VET system fit for the future

This case study focused on the implementation of a set of initiatives for improving the VET system that followed the recommendations of the Danish government's Globalisation Council that took place in 2005-06. The Council's fourteen meetings – chaired by the Prime Minister – comprised representatives from many parts of Danish society, including the Government, employers, trade unions and academic and research institutions. In addition, external, national and international experts were invited to contribute to some of the Council's meetings relevant to their area of expertise. The Council's work resulted in the Government's Globalisation Strategy (The Danish Government, 2006), which focused to a large extent on strengthening the quality and governance of education, including VET. Concrete targets in education were 85% completion rate of upper secondary education by 2010 and 95% by 2015.

The Globalisation Council's work was followed by a very thorough process. On VET in particular two committees were formed with the task of developing concrete proposals for achieving the following two aims: i) make the VET programmes fit for the future and ii) achieve the 95% target. The two committees came up with approximately 150 concrete recommendations in their final reports. These were discussed in Parliament and resulted in the 2006 Welfare Agreement, which approved the initiatives and provided funding for them.

At the time of writing this report the majority of these initiatives have been implemented or are in the process of being implemented. An evaluation of the whole follow-up process is being planned for 2009 but at the time of writing its exact terms of reference and the organisation that would conduct it had not been decided. In the longer term, the success of the initiatives will also of course be measured through the achievement of the set targets.

1.4. Case Study 2: Outcomes of the 2002/03 initiatives for reducing the number of school-based training in favour of practical, in-company training

This case study focused on a set of initiatives that aimed to reduce the number of school-based vocational training places. At the time students on VET programmes were able to fulfil the practical requirement of their courses either by obtaining a training placement with an employer or by doing their practical training at school; the latter was meant as a substitute for employer-based training for students who were not able to find a placement within a company within two months of completing their basic course. Students had to comply with four criteria: i) be qualified, ii) be geographically mobile; iii) be mobile in terms of choice of programme and iv) be actively trying to find an ordinary contract. However, the number of ordinary, employer-based training places was decreasing rapidly, while at the same time the number of students enrolled on school-based training was rising.

The situation was judged as unsatisfactory as analysis of employment rates for VET graduates showed that students who had completed school-based training in some occupations were less likely to find employment compared to their company-trained peers. In addition, employer organisations were concerned because of the cost of the scheme, as at the time they were funding school-based practical training via a collective fund, the Employers' Reimbursement Fund. In January 2003 the Government therefore asked the social partners to recommend a set of proposals that could improve the situation. The set of initiatives proposed was subsequently discussed and agreed in Parliament. Some of the measures were judged as controversial at the time and objected to by student organisations and trade unions, as they were thought to be undermining the concept of 'education guarantee' which is a fundamental but much debated principle of the Danish education system.

Concrete outcome targets were set to be reached by 2006 which were met and sometimes exceeded; for example, 9 960 additional practical training places were established compared to a target of 3 400. Data on these and other targets were drawn primarily from administrative databases.

2. Case Study 1: Follow-up to the Globalisation Council’s recommendations for a VET system fit for the future

2.1. Origins and background

The Globalisation Council (GC) set up in 2005 was a tool for creating a common understanding about globalisation. The aim of the Council was to ensure that Denmark would have appropriate policies in order to be able to perform successfully in the new global economy. Initiated and overseen by the Prime Minister in collaboration with five more Government ministers, it presents a clear example of a top-down driven innovation. Original driving forces came both outside as well as within the country. These forces were the changing landscape of the global economy and the ability of Danish businesses, industries and society to act successfully within this new context.

The GC can be seen as a very productive and successful process. Its work resulted in 350 concrete policy proposals, 320 of which became new pieces of legislation. Approximately 140 proposals concerned education policy. Implementation of these proposals is primarily financed through public funding. In addition, the GC generated a wider interest in and a debate on the challenges posed by globalisation and the need to respond to them.

Although there was a strong top-down push for innovation, the work itself involved a wide range of Danish stakeholders and an extensive consensual process was launched. The aim was to search for proactive solutions: changes in education policy, skills and job creation that would help Denmark to address the challenges of globalisation, rather than to “give up” to the temptations of protectionism. The process itself was therefore innovative in the way it broke down administrative barriers between different ministries. Five different ministers, in addition to the Prime Minister and his office, were strongly involved in the GC and the Secretariat that supported its work consisted of cross-ministerial teams of civil servants. Various stakeholders from outside the Government were involved directly with the work and its follow-up, ranging from employers’ and employees’ organisations, VET institutions and researchers from Denmark and abroad.

A website was created which provided up-to-date information on the Council’s work, thus encouraging public debate of the issues.

The GC’s work was informed by a 100 page background report on globalisation, commissioned by the Government. Four main areas were

identified as having a critical impact on Denmark's profile in the global economy:

- Education
- Research and Development
- Innovation and Entrepreneurship
- Structural Frameworks (*e.g.* a well functioning public sector).

Education, and more specifically VET, was identified very early as an area that needed systemic improvement. Although it was acknowledged that the VET system functioned well overall, a number of weaknesses were also identified that needed being addressed. These included, for example, the fact that VET was not considered an attractive development route by many talented young people and that drop-out rates were too high.

The Government also aimed at “correcting” some of the negative side-effects of the older reforms. The year 2000 reform put much emphasis on the quality of VET, making it, perhaps, too difficult for certain student groups to complete successfully. Thus, a mentor scheme was introduced to correct earlier emphasis on a more personalised approach in VET which was sometimes found to be very challenging to students with the most learning difficulties or those having insufficient support from family or other social networks.

In addition to reducing the drop-out rates the GC also addressed other aspects of VET. For example, there were initiatives for improving the innovative quality of the system. One such initiative gives the Ministry of Education the power to form new trade boards in emerging sectors (*e.g.* those related to leisure or “well-being”) if this is not done in a bottom-up way through the employer organisations and the unions themselves. As the Danish VET system relies heavily on consensus it lends itself naturally to stability and continuous, incremental development, as opposed to radical change. The issue of whether such changes are needed was raised by interviewees and it is further discussed in the general conclusions section of this report.

As a follow-up to the GC's work, two committees were established focusing directly on VET; the first committee's task was to come up with concrete recommendations on how to make the VET system fit for the future; the second dealt with the issue of raising completion rates in order to achieve the 95% target by 2015. Both committees were supported in their tasks through the work of ministry officials and external experts.

Although on the whole the processes for setting up the GC and the way this worked were regarded as successful by most participants, there were also a number of issues that caused tensions or disagreements. Firstly, despite the explicit efforts made to try and involve a wide range of stakeholders, some of the participants we spoke to felt that the process was rather authoritarian within the Danish context, that there was not much room for open discussions and that many initiatives had already been decided upon in the terms of reference. Others on the other hand viewed the process as in a way “legitimizing” an implicit agenda of issues that were already being debated by stakeholders in the field, *e.g.* employers or VET teachers.

Secondly, business and industry organisations did not entirely agree on the setting of objectives for the GC follow-up initiatives. They claimed that too much emphasis was put on the drop-out problem while too little was given to the new challenges of globalisation. For example, the good students in VET did not receive proper attention. Drop-outs do happen in both ends. Both the students having most difficulties and those who are most talented are in danger.

Finally, some participants expressed the view that certain aspects of VET did not receive sufficient attention in the innovation process. For example, it was thought that teaching methods, teacher training and curriculum issues were not discussed sufficiently in the committee to make VET fit for the future.

2.2. Use of the knowledge base

The question of how to ensure an adequate and sufficient flow of information during the process of policy reform is extremely challenging. There are questions around the issue of who is considered qualified and reliable enough to provide the information. Interests and views on education are diverse and there are contradictory opinions on the way educational policies should be designed and implemented.

As discussed above, the GC work was supported primarily through a cross-ministerial Secretariat, but also a great deal of external input from other stakeholders and researchers in the field. A broad evidence base was thus formed consisting of national and international research reports, discussion papers, and best practice cases.

The knowledge-base was wide and the quality of the background reports was high. There were, however, some tensions in the selection and use of the knowledge-base. VET has two separate, sometimes contradictory, roles. Its aims are to fulfil the growing competence needs of different economic sectors (economic role), and to help students succeed in their education

(social role). Some stakeholders felt that this double role was not reflected in the knowledge-base supporting the innovation.

Skills needs are diversified in the global knowledge society. Changes in the division of work mean that Denmark must move upwards in the competence hierarchy. At the same time companies also employ people who do not have formal qualifications. There are many alternative ways for building and developing the knowledge, skills, attitudes and values companies need. There is therefore a need for more flexibility and diversity in the VET system to allow for this diversification, and social partners wished that this diversity had been acknowledged and analysed during the data gathering phase of the GC's work.

Many participants expressed the view that there is little formal, research-based knowledge on VET available in Denmark and that this weakens many aspects of VET policy design and implementation. For example, according to some participants the drop-out rate is not significantly higher in VET than that in general, upper secondary education. Agreement on how to measure drop-out statistics and the availability of robust data are essential elements in the design, implementation and evaluation of initiatives targeting directly completion rates, such as those that came out of the GC's work.

Some of the persons interviewed suggested that the country would benefit from a totally new focus for improving the completion rates in VET by paying more attention to early childhood and pre-primary education. For students with learning difficulties it is often pre-primary education that gives the basis for "learning how to learn" skills.

Another area that would benefit from more research is that of understanding the relationship between education and employment: higher educational attainment does not necessarily mean better employment outcomes.

2.3. Implementation

Systemic innovation requires creative ideas, forward-looking orientation and open-minded anticipation of future developments. The will and the power to implement the ideas into practical actions are also important prerequisites for innovation. Innovation means that added value is brought to the system. In Denmark, serious efforts have been made to ensure the proper implementation of the GC and its follow-up initiatives, with the focus on reducing the drop out rate in VET.

However, some stakeholders questioned whether the conditions for the successful implementation of the initiatives were sufficiently analysed and

foreseen. One example of possible difficulties anticipated in the implementation phase results from the fact that a large proportion of Danish companies are small or medium-sized. Such companies normally need more support to be able to handle new challenges and implement reforms. It is also interesting that it is small and medium-sized companies that take on most VET trainees in Denmark; once their training is completed a significant number of these qualified young people are absorbed by the larger companies. SMEs do not of course bear the costs of this training directly as they are reimbursed the student salaries during school periods through the Employers' Reimbursement Fund into which all employers pay. It is thought that this practice cultivates innovative capacity and an entrepreneurial spirit in trainees, as they are likely to working alongside people who were themselves entrepreneurs and had started their own companies.

Other difficulties mentioned by participants concerned the pilot projects; some of them might face difficulties, because there is disagreement over who pays the salaries of VET teachers while they are in training.³

Teacher representatives expressed the view that there could have been more analysis of the outcomes of previous reforms and more continuity between past and current changes of policy. For example, more data on how the previous reform of the year 2000 had worked would have been useful. Modularisation and personalisation did not seem to work according to the expectations, at least not for the weakest students. There were some difficulties in the implementation phase of the previous reform, as well. There was too little time for prioritising between different actions and for identifying the most important measures. This caused some fears regarding the concrete outcomes of the new reform.

There are several enablers in the process of improving the completion rates in VET. The Danish Ministry of Education tries to provide a right mix of incentives to the various key players. The Ministry provides funding for pilot projects co-ordinated by the municipalities. Special funding is provided for further education of teachers about special teaching methods for "difficult groups".

These pilot projects are carried out in 17 municipalities, and they aim to test out better ways and methods for improving completion rates in VET. The projects include intensifying the collaboration between VET and primary schools, preparing students for career and education choices, and assuring a good flow of feedback between different stakeholders. As the Ministry representative expressed it, the call for proposals is "open for

³ According to Danish officials, this dispute has now been resolved.

anything you can think of that might be efficient in reducing the drop-out rate”. Denmark seems to follow an “Open Innovation” approach in this phase of the reform.

The aim of these pilot projects is to build up a knowledge base of good practice that can be scaled up in the future. The Ministry is in favour of encouraging some degree of competition between municipalities in terms of the results achieved: The right balance between competition and collaboration is seen as an effective incentive for systemic innovation.

2.4. Monitoring and evaluation

Evaluation is a judgement of whether the initiative has met its intended outcomes. In the case of the outcomes of the Danish Globalisation Council an evaluation will take place in 2009; its nature and scope are currently being designed, and will be put out for tender. In addition, a set of targets have been established by the Government that will be used in order to evaluate the outcomes of the initiatives such as the number of people entering and completing VET, their employment rates, and numbers entering higher education after VET.

As the evaluation of the GC work has not even started yet and it is too early to comment on whether or how targets have been met, we use this opportunity to reflect more generally on how evaluation fits more generally into the Danish framework for innovation and reform. In general, there does not appear to be a strong tradition of evaluation as an in-built component of VET policy-making, or indeed of educational policy-making generally in Denmark. However, this is only an impression, and if true it is no more so than in most OECD countries. Moreover, there are signs of a growing record of evaluation. The Danish Evaluation Institute (Denmark’s Evalueringsinstitut – EVA) was established in 1999 and carries out a series of evaluation studies. Recent ones have covered such issues as vocational guidance; personal study plans in technical and vocational education; and the links between production schools and vocational schools. So it would not be fair to say that evaluation is neglected as a component of the innovation process.

We have no privileged insight into the content or approach of the evaluation. But its imminence takes us directly to the question of how evaluations of this kind should be developed. One line of argument suggests that an approach to evaluation should be formulated at the outset, given the significance of the change, and sees it as a weakness that evaluation is only now being designed, two years after the initiative began. But the logic of this is not universal; building in evaluation from the outset may be best practice for some kinds of experimental innovation, but not necessarily for

all. It may be better for evaluation to be developed in the light of initial experience. There need not be any a priori judgements on exactly when in the process evaluation is introduced, although clearly there will generally be a preference for designing it early so that it is not merely a rationalisation. In other words, there are genuine discussions to be had about when, in a realistic political decision-making process, it is best to design as well as implement evaluation.

As discussed above, the GC was supported during its initial phase by a cross-ministerial Secretariat. Although we understand that this Secretariat has now been disbanded one suggestion is that a similar cross-ministerial team could play a part in informing the design and implementation of the forthcoming evaluation.

This links directly to the question of how evaluation is to be used. Here the issue is how far information and ideas from the evaluation process are fed back to participants, and inform both further development and public debate. At this stage we cannot judge what the intention is with the forthcoming evaluation; but this will be an important issue for the Ministry (which is responsible for commissioning the evaluation) and others to reflect on.

2.5. Conclusions and lessons learned

To summarise, the work of the GC was a top-down and a pre-planned process with strong involvement of other stakeholders such as the social partners. All stakeholders involved generally regarded the process as being successful and its outcomes as valuable.

It seems to us that in the minds of most participants the most important result of the GC and its follow-up initiatives was the wide acceptance of globalisation in the Danish society. The way VET is viewed in the Danish society also changed. Before the process some politicians were not satisfied with the way Denmark ran its training system. Most of the politicians have an academic education; they do not necessarily understand the logic of VET. There were many reservations, for example, about qualifications needs and the role of social partners in defining these needs. Dialogue, made possible by the GC, was very important in the way it put these reservations on the table.

One of the major conclusions of the GC and its follow up process was that Denmark should maintain its VET system as it provides the skills the labour market needs in an efficient way. This fact in itself, that is, the wider societal acceptance of the efficiency and success of the existing system, was a valuable outcome of the GC process, and could be characterised as “an

innovation” in itself. The process improved the conditions and the capacity of the Danish VET system to meet the growing competition in the global market for competence, skills, quality and performance.

Several minor outcomes were also raised and discussed by stakeholders in their interviews. For example the need for student support in VET was acknowledged and mentor programmes were created as a result. It was also recognised that there is a strong need for more research in VET; the Danish Pedagogical University (DPU) may have an important role to play in this respect.

3. Case Study 2: Outcomes of the 2002/03 initiatives on more practical training places and less school-based practical training

As described above, this case study focuses on the shift in the balance of training places, reducing the number of school-based places from 5 000 to 1 200 and replacing them with a range of more work-based practical training, which was accomplished by the end of 2007. Here we report on and discuss the processes which led to this outcome.

3.1. Origins and background

The shift was a controversial one and there are still criticisms voiced about it. There were two main factors behind the change, related to financial and quality issues, discussed below in turn.

On the financial side there were some interesting systemic factors at play. Collectively the employers bore most of the cost, through contributions to the Employer Reimbursement Fund, and were concerned about the implications of an open-ended commitment to provided school-based places. But at the same time individual employers were exploiting the fund by recruiting students from school-based training in preference to providing work-based training themselves, which they could do at a relatively low cost to themselves. Moreover schools had an additional incentive if they could provide their students in school-based training with ordinary contracts with a company. This was intended to reduce the number of students in school-based training – which incidentally had a rather low status - but provided a perverse incentive from the system’s point of view. This combination of factors had resulted in a growth of school-based training and a decline in the number of ordinary training contracts – the reverse of what had been aimed at from a policy viewpoint.

Overall, school-based training is almost universally seen as second-best, and the shift to workplace training as a quality improvement. The situation

is different for weaker students. But this in turn raises a further question, about how far VET is a kind of catch-all vehicle for all those who cannot succeed in the more traditional, (*i.e.* general or academic) school sector. This has become particularly pertinent with the adoption of the 95% completion rate, discussed as Case Study 1 above. For this means that provision must be made for many who would previously have left the system altogether; and since the traditional sector is not seen as appropriate for these students, the VET system is often the fallback. This implies that the VET system must bear the lion's share of the burden of complying with the 95% target. A significant policy question is how VET provision can accommodate increasingly diverse needs. One significant institution in this respect is that of Production Schools, which seek to provide a bridge for students who may be on the point of dropping out.

The arguments for retaining school-based training, as expressed primarily by student representatives, are twofold. Firstly, it provides stronger support for weaker students. Young people who might struggle with finding their way in work-based training, even in supportive working environments, could rely on closer back-up and attention in a school context where they, and not production requirements, are the primary focus of attention. A particular feature of this is the effect of being a part of a recognisable peer group: in a school a young person forms their circle of friends and this continues throughout their training career, whereas in a work-based scheme they do not have the same opportunity, since they are alternating between work and the college, with only brief periods in the college. This does not give them enough time to form the same degree of social contacts and the result is that they are more likely to drop out.⁴

The second argument is that school-based provision may allow young people more flexibility and provide them with more opportunities to exercise and develop their creativity in comparison to the work placement alternative. And although training at work is almost always reported as being the most relevant and often interesting part of the overall VET course, creativity and innovative capacity is highly prized in the Danish system. How justified is this argument? It is difficult to tell; whilst the case for better retention for weaker students was based on broad professional experience, there is no equivalent evidence for enhanced creativity.

There was, therefore, no straightforward consensus at the outset on the merits of the shift. Indeed the differences of opinion were quite deep, because of the implications of the move for the “social guarantee”, *i.e.* the guarantee of a relevant training offer which was seen as an integral part of

⁴ These students do however have the opportunity to form social networks within the organisation where they do their practical training once this has begun.

the Danish welfare approach. Carrying through the reform thus became a matter of some quite fundamental significance.

3.2. Use of the knowledge base

Unlike in the case of the Globalisation Council, where knowledge was systematically assembled and used in the form of papers prepared in advance of the Council and committee meetings, knowledge in this case was mainly based on statistics available through administrative databases. These collected information on measures such as numbers of students on school-based and practical training or employment rates for different types of graduates. In addition to this information, the process was informed by the informal knowledge available to stakeholders at the time regarding issues such as employers increasing dissatisfaction with the high costs of the system or the fact that schools were financially rewarded for providing ordinary contracts for students in school-based practical training. This informal knowledge was used by the ruling political party at the time during their negotiations with employers to change the system (details are provided in Section 3.3, Implementation). As we discuss more extensively below (see Section 4.2) this sharing and use of an informal, largely non-codified body of knowledge is one of the key features of the Danish VET system and it contributes to its ability to adapt and innovate in an incremental way.

3.3. Implementation

As we have noted the costs of school-based training were growing, and were apparent to the employers as a burden on the Employer Reimbursement Fund; this was therefore a major impulse behind the reform. The reform was also linked to the political sphere: following the elections of 2001, the *Venstre* party returned to power and members of the Education Committee seized the opportunity to press for a reform. Greater emphasis on the workplace was broadly in line with their political philosophy; however it did not command wide support as the Social Democrats regarded it as a threat to the social/welfare guarantee, which should guarantee a relevant training offer for all students.

The proposal was taken forward by the Ministry, responding to political direction. The main means for making progress was an overall deal which would invite employers to exchange one funding responsibility for another. In this case, the government offered to take off their shoulders the burden of funding school-based training – in return for them agreeing to contribute to the funding of training benefits for adult employee training in its place. This was seen as a more legitimate allocation – young people's training is part of

their initial education, which should be the state's responsibility, whereas employers can reasonably be expected to contribute to adult training. The offer for a swap in the allocation of funding was therefore seen as a way of drawing employers into negotiations with the aim to find compromise solutions. Following recent tripartite negotiations the contribution to the financing of lifelong learning has now been integrated into collective wage agreements, and this provides the means for engineering a shift in the profile of training provision.

The other side of this process was the reduction in numbers of school-based places. This meant that the government agreed to take over from the employers a considerable financial responsibility – and then proceeded to reduce this significantly by a set of policy initiatives, which meant that the more expensive school-based system was drastically cut. It seems, however, that the employers did not resent or protest at this outcome; they were satisfied with the result, namely a training system more closely tied to production, with trainees who deliver real benefits, and in fact it is possible that their overall expenditure on training went down as the contribution to continuing VET, which replaced the ever increasing costs of school-based training, was frozen.

The shift away from school-based training was implemented through a mix of general and specific initiatives. The former included the reduction in the amount of the training allowance received by school-based trainees. This was used as an incentive for students to seek out a work-based placement. Specific initiatives applied only to selected training programmes or courses, and included a regulation of school-based training in eight particular courses where the Government – following a consultation with the social partners - judged this to be the most effective way for changing behaviour patterns of students and employers. In these eight courses the number of students allowed directly into school-based training was set to zero, but this number is revised annually. This differential treatment by the Government of specific courses or trades was seen as one of the most controversial aspects of the reform, and it was certainly the first time that such a measure was applied. Students and some of the trade unions who objected to this reform did so partly on the basis of this particular aspect of it.

To sum up: Implementation was driven along by the concern of a major stakeholder in the VET system (the employers), allied with a political party (and individuals within it) who saw an opportunity to reform the system. Some trade unions supported the changes too, as they felt that the VET system was becoming at the time too school-centred. The instruments used for designing and implementing the new measures were a mix of central planning of a kind which may be familiar in some OECD countries but

which is quite new for Denmark; and tripartite decisions based more closely on the Danish model.

3.4. Monitoring and evaluation

How well has this change worked? More pertinently for this study of systemic innovation, how do we know whether or not, or how far, the shift away from school-based training has worked?

In the case of this particular initiative, no one disputed the fact that there had been a significant increase in the overall provision of training places, even as the number of school places had shrunk, and that there was little difficulty in finding training places for the apprentices in most courses. The overall figures have been given above, showing that the targets have been surpassed. The volume of training has therefore expanded beyond predictions. The shrinkage of school-based training places did not occur quite as quickly as planned – they had gone down by 63% by the end of 2006, but the target of 1 200 places was only achieved in 2007 – but this was not significant. This shrinkage was balanced, as we have seen, by an expansion in other forms of training which not only outweighed it (as planned) but exceeded the targets set. Information on all these measures comes through administrative databases.

Moreover the major readjustment in the profile of the training provision, between school-based and workplace, appeared to have been achieved with surprisingly little disturbance overall, despite the fact that the changes attracted considerable media attention and criticism at the time. It could be that the expansion occurred at the cost of severe distress to some parts of the system; this was not at all the impression we formed however by talking to our small sample of participants. One of our interviewees related that the number of school-based training places in his college had shrunk from 800 to 50, yet this had not led to anyone being without a training place, and he gave no indication that this quite dramatic change had caused particular problems. Another college principal told us that the school-based system had in the past produced 600 young people with tailor training for whom 3 jobs had materialised; now, they could concentrate on working with employers in the reviving Danish textile industry, focussing on design and creativity, and ensuring a much better mesh with industrial demand. She too did not refer to this as having been traumatic.

Everyone agreed that the ability of the system to change in this fashion was in large measure supported by the very strong performance of the Danish economy in recent years, with full employment and employers therefore keen to recruit wherever they can. Trainees bring real value to companies, especially in their later years, and with labour shortages quite

prominent it is in companies' own current as well as future interest to make sure they take on trainees. Whilst, therefore, it is fair to point both to the success of the scheme in quantitative terms and to satisfaction to date with its results, the sheer power of external economic factors has to be recognised. This is a problem for any over-simple approach to evaluation, rather than in any sense a criticism of the initiative or of the process governing it.

That said, what is less sure is how far the system will survive a downturn in the economy. One line of argument is that this may cause problems that the new system will be unable to cope with. However the Ministry's argument is that the school training places could be expanded in the case of a downturn in the supply of workplace opportunities. Moreover this could be achieved by administrative instruments, without recourse to a budgetary decision by politicians. It seems, somewhat surprisingly, that this is an open-ended commitment, so that civil servants monitor the situation regularly and can in principle carry on re-expanding the school-base system as necessary, with the consent of the Minister and upon consultation with the National Board of VET, but without recourse to political decisions. Nevertheless there are certain vulnerable spots. Few countries can be embracing globalisation as whole-heartedly as Denmark; but if, in line with this economic openness, Danish companies are taken over by foreign owners, and these new owners do not share the cultural commitment to apprenticeship training (but look for example, at balance sheets from a distance), the results could be quite disturbing. These are questions that could be explored in detail in an eventual evaluation of the initiative. Evaluation is an essential way of learning from such cases; and therefore of allowing at least for the possibility that even an initiative as apparently successful as this one may have other consequences.

3.5. Conclusions and lessons learned

The shift from school-based training to workplace training is a significant one, with implications whose relevance goes beyond Denmark. It is an emphatic assertion of the merits of a dual system.⁵ It is also a statement of faith in the Danish labour market, not only as a supplier of jobs but also as embracing arrangements which enable change to accommodate the future.

⁵ We heard of the parallel debates held in Denmark and Sweden about whether there should be a single system for all young people; the Danes are quite proud that they maintained their dual system, a decision which looks wise in retrospect, and the Swedes even seem to be considering reverting from a comprehensive upper secondary system to one which also includes an element of dual-type training.

The initiative placed quite some strain on the traditionally cooperative ethos and structure of the VET system. The initiative had a political resonance which went beyond its technical aspects, primarily through the perceived implications for guarantees given to young people under the Danish welfare system. These strains appear to have been managed, in part through the traditional tripartite structures but also involving some new departures. For example the regulation by the Ministry of the number of school-based places, resulting, in certain lines of training, in a significant reduction in numbers of such places is seen as an unusually interventionist step, nevertheless accepted.

Dissatisfaction with the school-based system emerged through the close-knit networks of stakeholders at different levels. In addition to its financial costs, school-based provision was criticised through the mechanisms for gaining student and employer feedback. Union and employer representatives systematically gather this feedback, and it is integrated into the system in a way which allows the incremental change referred to at the outset. It also allows the accumulation of knowledge about issues which potentially demand more systemic change.

There appears to be widespread consensus on the value and relative strength of workplace training over schools; this was the case even with the student representatives, even though they were also relative defenders of school-based provision. We can therefore see this change as strengthening further the adaptability of the Danish VET system.

4. General conclusions

This is one of the first pair of case studies to be conducted as part of the CERI systemic innovation in VET project. The overall aim is not to assess the initiatives as such, nor provide a review of Denmark's innovation capability in VET or in education more generally, but by placing the analysis of these case studies alongside those from other countries, to be able to draw some insights into the process of innovation, tying this firmly to the substantive area of vocational education and training. Because this report is written before any other case studies have been conducted, it has no comparators against which to formulate judgements and these limitations should be borne in mind when drawing conclusions. However we feel we can make some observations, as part of the evolving process of the analysis of innovation.

4.1. Innovation as incremental adaptability

The country visit showed that there are clear strengths in the Danish way of carrying out systemic reforms in VET. For example, the GC and its follow-up work were based on extensive co-operation between different ministries and stakeholders. Administrative or ideological barriers did not hinder work in favour of the common goal. The processes of the GC and its follow-up initiatives were logical and analytical. A wide evidence and knowledge base was gathered, in order to identify the needs for the reform and to search for the right tools to resolve the challenges. The practical work was carried out by clear, yet overlapping phases: the council and the committees. The process was led in a decisive way. The implementation has partly started in the form of new legislation and pilot projects and an evaluation is currently being planned.

One can conclude that both cases are excellent examples of the system level innovation capacity in the Danish society. In addition to discrete reforms like the GC and its follow-up work, there is a strong capacity for on-going, incremental change. Company placements have an important role in VET, transferring the needs of the labour market directly in the education system. The national and local trade committees act as “steering groups”, involving social partners as “owners” of the process. The social partners, VET organisations and the administration share the responsibilities for “tuning” VET into the needs of the future.

We have come to think of this characteristic of the Danish VET system of on-going change as “*incremental adaptability*”. The system seems to adapt by small steps rather than through radical change. But the system is such that it is able to take these steps on a fairly continuous basis, as necessary, so that change is something familiar to the actors involved. We have no yardstick by which to judge exactly what the scale of change achieved by this incremental process; but our judgement is that the capacity for continuous adaptation exists, and is routinely exercised.

VET was given extraordinary prominence in the Globalisation Council’s deliberations and in the recommendations which followed. This in itself is a major innovation; we wonder how many other countries would have produced anything like this from such a broad-ranging debate on globalisation. Can this be interpreted as a sign of panic or distress over the Danish VET system? Almost certainly not; rather it is a reflection of a mix of concern and confidence: concern that even a very strong system needs to change in the face of globalisation, but confidence that the Danish system can manage these changes. Proposals for innovation may spring from stasis or the emergence of glaring problems, but also from an ongoing momentum

for change; the process for implementing and evaluating them will take different forms accordingly.

4.2. Research and the knowledge-base

Danish VET research is seen on all sides as insufficient. The formal knowledge base is therefore lacking. Yet, as we have observed, the system itself is certainly nothing like as weak, and can reasonably claim to be among the OECD leaders. It is probably true that in no OECD country is VET research particularly strong, so we do not have good comparators for the relationship between quality of the formal knowledge base and quality of the system. Yet the Danish case gives pause for thought as to exactly how we conceived of knowledge-based systems, whether we refer to VET or other systems. An early conclusion would be that we need to think in terms of a variety of knowledge components, informal as well as formal; and to link those to the cultural practices of the system, which will determine how effectively the base is used.

The incremental adaptability that characterises the Danish VET system is based in large measure on *the sharing of informal professional knowledge*. We mean by this that the knowledge base of the innovations which we have observed is predominantly built from the accumulated knowledge and expertise of the professional agents involved in the system: the social partners, the government representatives, and the professionals on the ground, in the schools and colleges. Moreover, this knowledge is quite informal: it is mainly not codified, and often does not take documentary or published form. It is largely based on the experience of the individuals concerned. But it is not tacit knowledge in the traditional sense. On the contrary, it is the product of active and open discussion, in various forms, which leads to common understandings of a strongly consensual nature.

4.3. Collaboration and social capital

The sharing takes place partly because Denmark is a small country, and the people involved tend to know each other quite well, with friendly professional relations. They also appear to trust each other, as is evident from their willingness to speak openly in front of each other. In other words, as all international surveys show, levels of *social capital* are high in Denmark, and this applies in the VET sphere too. Whilst size makes this easier, it does not guarantee it by any means. But Denmark's levels of social

capital, at least in the VET system, are high by any standard. High levels of social capital enable the informal adaptability of the system.⁶

Social capital cannot simply be equated with trust. It denotes commitment to common values, and often to common objectives. Here too, it is obvious that the Danish VET system scores highly. We interviewed several pairs of union and employer representatives, and the good relationships between them were evident. It was especially clear that they shared a sense of *common ownership of the VET system* (ownership is used here almost in the literal sense, not just as a clichéd metaphor), and a commitment to maintaining and improving it. Moreover they referred frequently to fruitful exchanges with Ministry representatives, which routinely provided a basis for addressing issues and achieving progress.

The contribution of social capital to Denmark's incremental adaptability has a strong *structural underpinning*, through the well-established tripartite system. As we have just observed, trade union and employer representatives meet each other regularly at different levels. The Trade Boards which regulate VET are the most evident feature of this; they govern the fields in which VET occurs, keeping their ears to the ground, assuring quality and adapting the curriculum to future needs. This control is very extensive. An indicator of this is the fact that the social partners had allowed the Ministry to intervene in order to regulate emerging areas where they could not produce arrangements themselves was remarked on several times as an unusual step – indeed an innovation.

In addition to this structural feature, the dominant *culture* is one of collaboration. In general, people set out to work together to achieve solutions. This does not mean that everything is decided through cosy consensus. For instance, the case study on school-based training revealed that there had been strenuous disagreement over the proposals, with political and union representatives feeling that this was in breach of the social guarantee. Similarly objectives such as the 95% completion target set up by the GC are complex and controversial. Some Danish stakeholders in VET criticize the 95% target and fear that too much focus is put on improving the completion rate and not enough on the quality of VET. But it is clear that participants approach issues with the intention of solving problems.

⁶ The Danes themselves refer to their own system, without complacency, as tight-knit, with continuous dialogue between stakeholders and small cultural as well as geographical distances between them (*The Danish Approach to Quality in VET*, 2nd ed., 2008, p. 10).

4.4. Promoting innovative capacity

The Danish dual VET system relies strongly on company placements. Company placements can be seen as an excellent way to foster the innovative capacity of people in training. One of our participants expressed this in the following way: “*Chaos in a company is helping the student to learn innovativeness and creativity. You can not teach that in a class-room or in a laboratory.*”

The combination of work placements and theoretical training is an efficient way to learn the skills needed in the global knowledge society. Company placements show the necessity to adjust to the changes in the modern working life. The ability to act independently and proactively and the need to learn new skills continuously becomes a reality.

The role of the school-based learning in the innovative capacity-building sense can not be neglected either. Skilled teachers, modern learning environments, curricula, teaching methods and technologies are of great importance.

5. Recommendations

In this section we provide some recommendations concerning the process of innovation in VET in Denmark, based on our knowledge of the two case studies (Sections 5.1 and 5.2), as well as some more general thoughts on the VET system and related policies and the challenges they may face in the future (5.3). Although the latter may not be directly related to the study of innovation itself, they are relevant as they may well be the focus of future innovations or reforms to the system.

5.1 Research and the knowledge base

We saw earlier (section 4.3) that structure and culture in the Danish VET system reinforce each other. However, this does bring some risks with it. The reliance on internally generated knowledge means that approaches and analyses from a different angle are not available to those involved. This may – though this is hypothetical speculation – lead to assumptions going unchallenged, for instance about the nature of key problems or about the effect and effectiveness of VET policies.

Where might such external analyses be found? There are a number of possible sources: academic research, think tanks, private foundations. However the latter two do not figure much in Denmark, and VET research is on the whole weak. Educational research in Denmark generally (*i.e.* not just

on VET) was criticised in a 2004 CERI/OECD review, for quality and for its lack of relevance to policy and practice.⁷ This led to significant, and continuing, efforts to improve research, mainly through the restructuring of the Danish Pedagogical University. The fruits of this are still to appear. Within education research studies of VET are few, and do not appear to have exercised much influence on policy thinking, though quantitative and qualitative studies have been carried out on topics such as student backgrounds; student course choice; their expectations and their perceptions of pedagogy.⁸ The Ministry itself commissions some research in this field, but there is a broad consensus that VET research in the formal sense is very underdeveloped.

The natural conclusion might appear to be that there should be a strengthening of VET research at the DPU and possibly at other universities too. We do indeed conclude that this would be a good idea. However there are two comments to be made on this. Firstly, we need to acknowledge that Denmark has a VET system which is generally regarded as good or even very good by world standards – and it appears to have achieved this with a weak knowledge base as measured by conventional research. The relationship between a formal knowledge base and the quality of a VET system is not a simple direct one. It is possible to have one without the other.

Secondly, and as a result of this observation, we support more formal research on VET mainly as a means of refreshing and challenging existing thinking, rather than as a fundamental base for future planning. In other words, the incremental adaptability of the Danish VET system could be enhanced if stronger external research into VET existed, contributing alternative approaches and research results which may not conform to the orthodoxy. The system, it seems to us, is strong enough to benefit from the potential challenge of such external inputs, without losing its fundamental stability and quality.

Another way to improve the knowledge base is to make better and more systematic use of existing data and evidence. It appears for example that the social partners have an extensive database containing feedback data collected from students in company placements. This could be used more efficiently by VET researchers at national level. This however should not be done to the detriment of the strong element of trust built in the system or of

⁷ OECD/CERI (2004), *National Report on Educational R&D. Examiners Report on Denmark*, Paris, OECD.

⁸ See Vibe Aarkrog (2005), *What do we know? Danish research within the field of VET 2003-5*, Danish University of Education; a more recent review of the topic by the same author has been completed but is not yet available in English.

the sense of ownership experienced by the social partners regarding the system.

The above comments do not, incidentally, imply that there is an unwillingness currently to consider evidence from outside the system. Denmark has been one of the most vigorous users of OECD services, including several reviews into different aspects of its education and training system. Minister Haarder stressed to us how useful these have been and how actively he has made use of international comparisons. Denmark's voluntary participation in this study of systemic innovation confirms this. It has also been active in the debate at European Union level. The point is that systemic adaptability requires occasional gritty inputs in order to maintain its energy and capacity to innovate.

5.2. The process and dynamics of innovation

Although, as discussed above, the process of innovation and reform in the Danish VET system works on the whole smoothly, this does not mean that there is no room for improvement. Students in particular felt that they do not have many possibilities to be actively and systematically involved in the innovation process. This is the negative side of company placements: although student councils exist, it is difficult to organise their work because students only spend ten-week-periods at school at a time. The rest of the time they are on workplace placements. There is a need for new ways of achieving bottom-up approach to innovation in VET. Modern technologies could perhaps play a role in this respect.

Who are the real drivers for innovation in Denmark? In the GC case, the government played a very important role. This may have as a consequence that implementation faces a certain degree of resistance to change. To some extent this is understandable, as resistance to change is almost always present when systems are renewed. Questions may be raised, though, as to whether the GC process, dealing with challenges involving a wide range of stakeholders, could have been more bottom-up. Were the essential stakeholders in VET, for example SMEs, learners and teachers, given enough opportunities to express their views?

5.3. The VET system: current and future challenges

An issue worth considering when thinking about the Danish VET system as a whole is that of emerging system-level challenges. Better tools are needed in order to create a sufficient evidence base about the education system as a complex system consisting of inter-related sub-systems, such as VET's links with other parts of the system. For example learning outcomes

in primary schools may have a strong impact on learning outcomes in VET. Another system-level challenge results from the changing roles different professionals have in the global knowledge economy. Professionals need increasingly to co-operate closely with one another and clear-cut barriers between “VET professionals” and others are disappearing. An example is that of research and development personnel vs. VET professionals; both sectors are facing growing quality and competence demands.

As a result, there is the issue of ensuring a continuity of skills and competence building and co-operation between VET and Higher Education. This issue was not at the core of the country visit – but it is an area which might merit further analysis when considering how to develop a VET system fit for the future.

Finally, there is a tension between the skill needs in new, emerging business areas versus the stability-needs of the “traditional” labour-market. The tension was described as a ‘battlefield’, by one of the people interviewed.

The GC did identify this obstacle in the Danish VET system, namely being intensely based on the existing structures of the labour market. New promising economic sectors were analysed and forecasts were made. It is necessary that traditional business areas renew their business models, technologies and processes. There is also a need for dialogue between existing and new trade boards.

We believe that research on and analysis of these structural issues need to be strengthened. Alternatives to the present system are not being adequately explored. What will the future educational system look like? Globalisation, new markets and emerging technologies shape products, services, people’s values, attitudes and behaviours. The global division of work will be different in ten years’ time from how it is today. There is another challenge: Denmark may soon face a lack of qualified teachers as teachers are ageing. This may mean that the division of labour between companies and schools and the roles of teachers should be re-considered.

6. Implications for the study of systemic innovation in VET

The Danish case, illustrated in different ways by both initiatives, is a very strong warning against any linear model of innovation. This is most striking in the case of the Globalisation Council. There can be few more striking examples of a top-down process: initiated and very prominently driven by the Prime Minister himself, with a small, strong central Secretariat, with no real resistance to the general direction. And yet the follow-through, taking forward the thrust of the arguments on VET, was

mediated by the tripartite structure, in such a way as to enable the initiatives to be pursued, as far as we can tell, without overturning traditional approaches. No one doubted the scale or ambitiousness of the initiative. But it has not been a matter of following through a sequence of steps, with plan, implementation, evaluation.

Similarly, the knowledge flowing within the system is not formal or systematic, and in fact this lack of formal knowledge and academic research in VET was one of the aspects of the system found weak by most participants. However knowledge does exist in the form of professional expertise developed and shared by all stakeholders in the system, such as VET practitioners, ministry officials or employers. In addition, due to the structural and cultural factors discussed above stakeholders are able to share this knowledge between themselves and use it in order to improve the system.

This characterisation, of incremental adaptability based on informal knowledge, brings into question not only simplistic notions of rational linear innovation moving from an overt knowledge base to implementation and evaluation. It also tends to undermine even more interactive models which are based on discrete phases of innovation. It therefore provides an excellent starting input into the general CERI/OECD discussions of innovation processes.

ANNEX 1

List of participants

The following people met the expert team and discussed with them one or both of the case studies.

They are listed here in alphabetical order.

Mr Bertel Haarder	Minister of Education
Ms Vibe Aarkrog	Researcher, Danish School of Education, Aarhus University
Ms Astrid Dahl	Director of College EUC Sjælland
Mr Rasmus Gudmansen	Former Apprentice and Chair of the Students’ Organisation
Mr Niels Jørgen Hansen	Director of Tekniq, National Employers Organisation for Electricians and Heating Engineers
Mr Jan Hjort	President, Danish Association of Technical Teachers
Ms Eva Hoffmann Berg	Director of College CHP West
Mr Ejner Holst	Elected Secretary for Education in the Danish Confederation of Trade Unions
Mr Peter Høier	Head of Division, Ministry of Foreign Affairs
Mr Allan Jørgensen	Guide in a local Guidance Centre
Mr Flemming Larsen	Deputy Director, Confederation of Danish Industries
Ms Lisbeth Lenz	Chief of Schools in the municipality of Ishøj

Mr Per Madsen	Elected Secretary for Education, Danish Metalworkers Union
Mr Lars Mahler	Director, Ålborg Technical College
Ms Inge Mærkedal	Director General of the Danish Agency for Science, Technology and Innovation
Ms Tina Nedergaard	Member of Parliament for Venstre
Mr Simon Neergard-Holm	Representative of the Confederation of Danish Employers
Mr Henrik Nepper-Christensen	Permanent Secretary, Ministry of Ecclesiastical Affairs
Mr Stig Nielsen	Employee of the Ministry of Education of a Production School
Mr Niels Preisler	Permanent Secretary, Ministry of Education
Ms Mette Ringsted	Rector, Tårnby Gymnasium
Ms Hanne Shapiro	Centerchef, Technological Institute
Mr Jonathan Simmel	Former Apprentice and Chair of the Students' Organisation
Mr Roland Svarrer Østerlund	Senior Adviser, Ministry of Education
Mr Peter Torstensen	Director, Symbion Science Park