

BRIEFING NOTE

Innovation and training: partners in change

Vocational education and training is contributing to innovation and training is becoming more innovative

Education and training are encouraging the creativity and innovation that can transform economies and societies. At the same time, innovation in new forms of cooperation and changes in curricula, teaching and technology are bringing greater flexibility and modernising vocational education and training (VET).

VET supporting economic and social innovation

Many recognise higher education's role in stimulating innovation, but VET's contribution is understated. VET at all levels, as well as academic higher education, can stimulate innovation. Although most innovation indices do not take account of VET, the Innovation Union Scoreboard shows that the impact of upper secondary education on innovation in the EU is increasing. This matters because, according to Eurostat, in 2013, around 49% of the 22 million learners at upper secondary level in the European Union (EU) were in VET. Developing their ability to innovate can bring considerable economic and social benefits. Learning at the workplace also has a positive impact on innovation performance ⁽¹⁾.

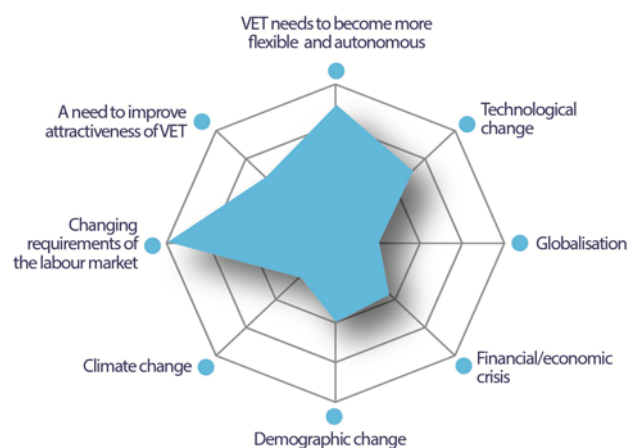
EU countries recognise this and are trying to tap the potential of all VET learners. The Netherlands regards VET as the basis of a 'learning' economy. In 2013, France set a national goal to improve VET to support economic recovery. Denmark integrates creativity and innovation in its VET programmes to strengthen its position as a knowledge society.

VET also supports social innovation. Civic competences and social awareness skills acquired through VET not only improve work organisation, but also strengthen civil society. In Germany, VET programmes to integrate young adults with special needs into mechatronics apprenticeships illustrate the close partnership between VET and social innovation.

⁽¹⁾ Cedefop (2012). *Learning and innovation in enterprises*.

The programmes were awarded the Hermann Schmidt prize for innovation in VET and contributed to social innovation. They promoted equity by integrating people at a disadvantage into the labour market while developing social and interpersonal skills, including tolerance in society as a whole. Other countries are also using VET to change society. Under Hungary's social inclusion strategy, key competences of the Roma population are being developed through continuing VET tailored to their specific needs. Estonia and Lithuania are influencing attitudes by using VET to develop key competences, not only for employment, but also to promote an inclusive and tolerant society.

Figure 1. Reasons for recent innovation initiatives in VET, EU+, 2014



Source: Cedefop, based on examples from ReferNet.

Reasons for and types of innovation in VET

To help people innovate, initial and continuing VET must become more creative and innovative; there is evidence that VET is changing across Europe. Cedefop's ReferNet network, based in EU Member States, Iceland and Norway (referred to as the EU+), provided some examples of recent innovation

initiatives and reasons why they were undertaken (Figure 1) ⁽²⁾.

These reasons include a need for new skills as a result of technological change and globalisation. In Germany, for example, digitisation and flexible manufacturing processes have already prompted debate about new approaches to VET that emphasise digital skills (Box 1). But other factors are also encouraging innovation in VET, such as demography, financial constraints and the aim to attract more students to VET.

At their meeting in Riga in June 2015, the European Commission, Member States, EU candidate countries and social partners reaffirmed innovation as a principle of VET modernisation. European VET policy encourages innovation in VET at all levels in various ways, including new learning methods, use of technology and new funding mechanisms. It also

Box 1 VET of the future (*Berufsbildung 4.0*)

Flexible production in smart factories that integrate different work stages and processes through digitisation and networks of interacting systems and tools: this is the vision of Industry 4.0 (*), or the fourth industrial revolution.

The new technologies, working environments, organisational structures and different forms of internal and external cooperation of Industry 4.0 have major implications for initial and continuing VET at all levels. In addition to a strong core of technical and generic skills and competences, skilled workers will need digital and problem-solving competences and knowledge management abilities. Social and communication skills, team work and autonomy will also be more important.

Germany's Federal Institute for VET (BIBB) is already talking to experts from vocational practice and research and drawing up proposals on how Industry 4.0 can have the skills it needs.

Learning may need to be structured differently. Virtual learning environments (that can reduce the costs of expensive training), new partnerships, different learning venues and hybrid qualification routes in collaboration with higher education could all be part of *Berufsbildung 4.0* – the VET of the future.

(*) VDI; ASME (2015). *Industry 4.0*. White paper. A discussion of qualifications and skills in the factory of the future: a German and American perspective.

⁽²⁾ Information and data cover the 28 EU Member States, Iceland and Norway.

Figure 2. Types of innovation measures in VET, EU+, 2014



Source: Cedefop, based on examples from ReferNet.

promotes stronger cooperation, particularly on work-based learning, between VET institutions, higher education, research organisations and enterprises. Taking European VET policy as a starting point, ReferNet has given some insights into the types of innovation taking place in VET (Figure 2). It should be noted that the examples reflect innovation in the countries concerned. Innovation lies in doing things differently and what is innovation in one context may be standard practice in another.

New forms of cooperation

Innovation lies in cooperating with new partners and in the fresh ideas new contacts can generate. Cooperation between employers and VET is strengthening. The Czech Republic is testing new cooperation models between VET providers and enterprises to promote work-based learning. Sweden's 'college concept' is based on strong cooperation between different levels of education (secondary, higher and adult) and the world of work. In Hungary, the Chamber of Commerce and Industry is now a key partner with government in all VET-related matters. In Ireland, industry has an important influence on VET curricula, while in Poland, VET programmes are approved by employment councils.

International cooperation is also boosting innovation. Lubuskie province in Poland and Brandenburg State in Germany, have established an education cluster to encourage cooperation. The cluster shares resources (workers, learners and infrastructure) between the municipalities, education providers and enterprises, as well as higher education and research institutions. Italy's *Porto futuro* centre for guidance, training and employment drew from the experience of France's *Cité des métiers* and Spain's *Porta 22*. Through the European alliance for apprenticeships, countries with

strong apprenticeship traditions are sharing their experience of how to develop work-based learning. In the context of Using the alliance, countries like Greece, Italy, Lithuania, Malta and Slovenia are reviewing their apprenticeship systems with Cedefop's support.

Box 2. Denmark's education laboratory

Starting in 2012, Denmark's education laboratory project challenges how education institutions think of and develop learning, teaching, organisation, management and guidance in VET. Some 10 education and four research organisations undertook more than 120 experiments from VET to PhD level on how to make the education and training system more flexible and demand-oriented.

Cooperation between different types and levels of education, as well as research and enterprises, is also developing. In France, 31 new *Campus des métiers et des qualifications* link VET with the world of work to ease entry into the labour market. The campuses also network VET and general education, training centres, higher education and research institutions and enterprises. They provide VET programmes at all levels to strengthen links between initial and continuing training. Latvia's new VET competence centres also include general education programmes. Ireland actively promotes partnerships between VET and higher education, while Denmark has promoted innovation in VET through experimentation (Box 2).

But innovative cooperation in VET is not limited to education, research and business. In Austria, for example, apprenticeships involve cultural institutions to encourage objectivity and open-mindedness.

Rethinking VET curricula and teaching

Needing to develop transversal competences, such as problem solving, reflection, creativity, critical thinking, learning to learn, initiative, risk-taking and collaboration (all of which help people to innovate), VET curricula are being transformed.

The move to learning outcomes, stimulated by national qualifications frameworks, which enable qualifications to be compared, has encouraged more flexible curriculum modules. This is because learning outcomes base curricula on what a person knows and can do at the end of any type of formal or non-formal learning experience. This differs from learning inputs, which structure curricula around the duration and place of learning. Malta has developed entrepreneurship modules for its post-secondary VET

and is in an advanced stage of producing a learning outcomes framework which covers all subjects in compulsory education, including initial VET. Prior to joining the EU, Croatia also developed learning modules, in line with European VET policy priorities.

Most initial VET is at secondary level, but VET programmes are increasingly found in post-secondary and tertiary-level VET in EU countries ⁽³⁾. To meet employers' demands for up-to-date vocational skills, curricula are being adapted to provide more work-based learning. In Sweden, following reforms in 2011-13, all upper secondary VET students have at least 15 weeks of in-company training.

Some countries are encouraging innovation in VET curricula through organisational change. Slovenia, for example, is transferring decision-making from national to local level and customising teaching through 'open curricula'. Poland has given schools more autonomy in using EU funds and in working with social partners and higher education institutions.

Linked to curriculum development is innovative teaching. Group work, problem-based and project-based approaches are developing (Box 3). Lithuania's largest VET centre offers a non-traditional learning

Box 3. Innovative VET in Norway and Cyprus

By converting homes built in the 1970s into energy-efficient 'passive houses', VET students in Norway's Aust-Agder region acquire skills about energy-efficient house technology and the construction sector addresses skill gaps in this area.

In partnership with the municipality, banks, university and architects, the school acts as an entrepreneur, building and renovating homes for a customer (usually the municipality). The customer recognises that the learning process, not the timeframe, takes priority.

The project began as a pilot in 2009 and VET students combine learning about technology, green building and energy efficiency with a complex building project that is working to a schedule.

In Cyprus, working groups of VET school teachers and students, supported by professional advisors, carried out market research, developed ideas and designed product prototypes. These included garages with solar panels for charging hybrid/electrical cars and benches with solar-powered USB connections for charging mobile phones at the bus stop or in the park.

⁽³⁾ Cedefop (2014). *Qualifications at level 5; progressing in a career or to higher education*.

Box 4. Technology in training teachers and trainers

- Denmark's emu.dk platform helps VET teachers and trainers improve the quality of learning in VET.
- Austria promotes instruction in digital competences for teachers through its EPICT (European pedagogical ICT licence) project.
- Croatia is developing e-learning to improve teaching and make VET a more attractive learning option.
- Estonia is developing e-learning materials and the digital skills of VET teachers to enable them to create e-courses based on national curricula.

model that devotes 40% of the time to key competences. In the UK, the studio school model of education offers personal learning plans and access to personal coaches to encourage independent learning and problem solving.

Technology is also changing VET. The Czech Republic's digital education strategy, launched in 2014, is moving teaching towards communication and logical thinking. Spain is developing virtual VET learning environments, while in Austria the E-cool project promotes innovative teaching didactics for self-organised competence-based learning.

Innovation is also changing VET for teachers and trainers. In Bulgaria, a multinational project is developing and testing a new methodology to train trainers to teach civic and social skills to security sector employees. Technology is also playing its part (Box 4).

Still more innovation in VET

Assessment methods are also changing. Lithuania is piloting more flexible assessment methods, including self- or group-assessment. Many countries validate non-formal and informal learning. In Iceland, for example, workers in the aluminium smelter sector can have their skills assessed in a formal process called *raunfærnimat* (real competence validation); this can lead to formal qualifications.

Competitions and awards also promote innovation. In Malta, VET students participate in international competitions, such as Young Enterprise, which challenges students to launch new companies to acquire experience in business start-ups. In Romania, awards recognise VET providers that promote excellence and innovation.

Budget cuts have affected VET in many countries. Doing more with less requires unconventional solutions to sustain and, where possible, increase the quality of VET provision. Even countries less affected by the

economic crisis are looking for more efficient funding models. For example, Norway and the Netherlands have introduced new ways of financing VET that encourage graduation on time.

The way forward

Innovation is complex, but policies can encourage it. Although not yet systematically reflected in innovation indicators and scoreboards, VET is increasingly an innovation driver. But Europe has not yet fully exploited its potential to encourage innovation in enterprises and society ⁽⁴⁾.

Innovation in the labour market is reshaping VET. This requires VET itself to become dynamic and innovative. Making VET more innovative can increase people's potential to innovate and change the economy and society. Further, VET needs to innovate to be a relevant and attractive learning option and regarded by enterprises as an investment rather than a cost. Promoting learning at the workplace through learning-conducive work environments provides an opportunity to bring together learning and innovation policies and promote innovation through fresh ideas and intergenerational learning.

VET is moving forward through new partnerships, system reforms, curriculum development, new teaching and assessment methods, different financing models, and other measures. The examples above reflect the variety of measures, but only give a flavour of recent developments in Europe. Cedefop's upcoming work on skills ecosystems will provide many more insights, but one thing is increasingly clear: VET and innovation, rather than being separate issues, are mutually supportive as each improves the other.

⁽⁴⁾ Cedefop (2012). *Learning and innovation in enterprises*.