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Research Report

Comparing international vocational education and training programs: The KOF Education-Employment Linkage Index. Includes a special section on applying the KOF EELI to VET policy

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Report

Comparing International Vocational Education and Training Programs: The KOF Education-Employment Linkage Index

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Comparing International Vocational Education and Training Programs

The KOF Education-Employment Linkage Index

Includes a special section on applying the KOF EELI to VET policy

Dr. Ursula Renold, Dr. Thomas Bolli, Dr. Katherine Caves, Jutta Bürgi, Maria Esther Egg, Johanna Kemper and Ladina Rageth

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Comparing International Vocational Education and Training Programs

The KOF Education-Employment Linkage Index

By Ursula Renold, Thomas Bolli, Katherine Caves, Jutta Buergi, Maria Esther Egg, Johanna Kemper, and Ladina Rageth

Problem

Vocational education and training (VET) is a major policy topic for countries all over the world, who are eager to learn from the best examples where participation in VET is high and youth unemployment is low. Policymakers want to know how strong VET systems manage challenges like rapid technological change, matching labor market demand for skills, attracting enrollment, and creating high-status VET programs.

There is a perception that the secret lies in the intended curricula of successful VET programs, and a curriculum comparison of better and worse programs could uncover it. The hope seems to be that such a comparison would yield a simple solution—incorporate more STEM subjects perhaps, or make sure all students learn soft skills. However, that is not the case. What differentiates the strongest and weakest VET programs is the level **of linkage between actors from the education and employment systems**, which we define and measure, then use to compare countries' largest upper-secondary VET programs.

Issues with curriculum content comparison

Merely analyzing the contents of a VET program's curriculum would give us null or misleading results. VET by definition has a greater focus than general education on preparing young people to enter the labor market. Its success is measured at least in part by how well graduates fare in terms of employment and unemployment, working conditions, skills mismatch, and transition smoothness from school to work.

It is incorrect to assume that copying the curriculum content of the best VET programs would help struggling VET programs improve. Countries' labor markets are unique, so

curriculum content needs to be accordingly unique. For example, an ideal curriculum for retail in a high-skill, high-wage country where apprentices learn multiple processes would be detrimental to labor market outcomes for young people in a country where retail workers are expected to have lower wages and narrow, single-process skill sets. The apprentices would be overqualified and unemployable. VET programs improve youth labor market outcomes by meeting the needs of the labor market. They achieve high status by enabling graduates to enter the labor market or further education, should they so choose. The contents of the curriculum is the wrong place to look.

Curriculum content in VET programs is not necessarily the largest factor in their success. For example, if a VET program is to help young people enter the labor market, it needs to include an element of experience. Employers increasingly value experience in applicants (Buchmann & Mueller, 2016), so substantial workplace training will help graduates transition into work. School-based VET programs do not offer substantial workplace training, and compared to dual work- and school-based VET they are much less helpful and even occasionally detrimental to all the dimensions of labor market outcomes (Bolli, Egg, & Rageth, forthcoming). Therefore two programs with identical curricula, but taught in school-based and dual VET styles, would have very different impacts.

Another problem for direct curriculum comparison is choosing the occupations to compare within a given program. Countries' VET programs can have a few broad occupations, or they might include hundreds. For example, South Korea's VET High Schools have five specializations and Finland's school-based VET program has eight fields of study, while Germany's dual apprenticeship has 328 occupations and Estonia's school-based VET has a staggering 657 (Renold et al., 2016). It would obviously be misleading to compare a broad "manufacturing" occupation to a highly refined "high-voltage electronics manufacturing" occupation, and it is equally unreliable to fabricate groups of smaller occupations. Even if such groups were created, how would one compare the detailed specifications of a defined occupation to the general guidelines of a broader one? The two curricula would be addressing potentially similar ideas, but at very different levels of granularity.

Even in general education, policymakers understand that **the way material is presented and the context in which it is learned matter, not just the contents of the curriculum**. Qualified teachers—or trainers—matter, as does the right equipment and appropriate evaluation. In a recent survey of Colorado employers, respondents stated that nearly every hard and soft skill listed is better learned at work than in school—the exceptions were advanced math and communication, which are better suited to classrooms (Renold, Caves, Bolli, & Buergi, 2016; Bolli & Renold, 2017).

The content of a VET program needs to change over time with technology, processes, and evolving labor markets. Comparing only intended curricula would leave out the processes by which countries update VET programs, and therefore ignore whether the programs are future-proof or likely to fall into obsolescence. **Comparing VET curriculum content without including updating mechanisms does not fully reflect program quality.**

These and other issues address the broader issue that **VET curricula are processes, not documents**. Unlike mathematics which can be the same across contexts, vocational skills are not perfectly comparable across countries. Therefore, the difference between strong and weak VET programs is how well decision power is shared between actors from the employment system and those from the education system: **education-employment linkage**. This study develops a KOF Education-Employment Linkage Index (KOF EELI) that measures power sharing through curriculum design, application, and updating phases to identify the best VET programs.

Study Design

Table 1: Country list	
Focus Countries	Secondary Countries
Switzerland	Austria
Denmark	Canada
Hong Kong	China (Shanghai)
Korea	Germany
Netherlands	Estonia
Singapore	Finland
	Iceland
	Japan
	Lithuania
	Luxembourg
	Norway
	Poland
	Singapore
	Taiwan

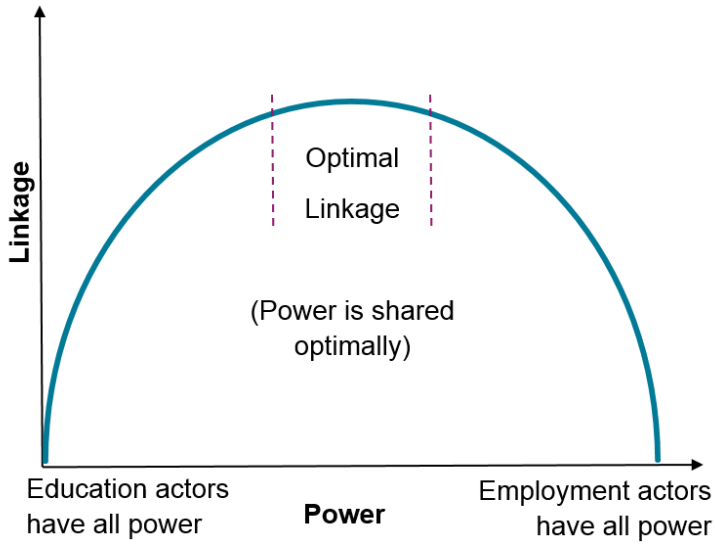
This study compares the biggest VET programs in 20 top-performing countries (Table 1), selected based either on the strength of their youth labor markets or of their general education systems (Renold et al, 2015). One-page descriptions of each country and the program we studied are in Appendix 2. Full details are in Renold et al., 2016. We use the KOF EELI to determine which systems have the strongest linkage, and compare across countries by developing four possible categories: dual VET, school-based VET, career education, and regulated training.

We find that countries with higher linkage tend to have stronger youth labor market situations, and lower youth unemployment specifically among countries with more data reported to international statistical organizations. Among countries that do not report such data, the relationship is unclear. Because of the small sample size in this feasibility study, no correlation is statistically significant.

Defining education-employment linkage

We define optimal education-employment linkage as an **ideal balance of power between actors from the education system and actors from the employment system** on decisions related to all processes of VET, from curriculum design through application and updating.

Figure 1: Education-employment linkage is power-sharing



For VET especially, **there is an asymmetry in the information and resources available to educators and employers**. For example, educators can develop curriculum and teach general education subjects, while employers know what skills matter and have skilled workers to train them. Similarly, schools have teachers, classrooms, and student-oriented infrastructure. Employers have state-of-the-art equipment, money for wages, and real production environments. While educators operate in subjects, employers work in projects and processes on products and services.

When education-system actors have all the power, the result is school-based career education or VET that ignores the needs and opinions of employers. This leads to a number of common VET-program struggles. For example, falling far behind current labor market demand, like the horse-shoeing curriculum we have seen in a major American city not known for its horse population. It can also lead to an over- or undersupply of certain occupations, usually far too many hairdressers or personal trainers and never enough skilled welders or cybersecurity technicians.

Most commonly, though, fully education-side programs tend to be unrelated to the current state of the field, with limited opportunity for practical experience and major challenges finding skilled teacher-trainers. Students learning practical content in classrooms might not get the right mix of skills, or find out too late that they do not enjoy working in their occupation. Educators cannot know how and when to update as technology and demand changes—nor should they, since their job is education not business cycle and technology monitoring.

At the other end of the spectrum in Figure 1 are **programs dominated by employment-system actors**, or on-the-job training. These programs can help employers fill jobs and offer plenty of practical experience, but they are unlikely to connect with further education pathways or offer permeability with general education programs at the same level. A further risk is that employers will underinvest in on-the-job training programs, get participants only to the level where they are barely productive enough, and stop training. This creates a low-quality program that is not attractive for potential applicants and probably not aligned with the goals of the education system.

Education-side programs are, in economic terms, too general, and employment-side programs are too specific. **Optimal linkage is in the middle, with education- and employment-system actors both having power in key decisions.**

Measuring education-employment linkage

We measure linkage throughout all VET processes, divided into the three phases of the Curriculum Value Chain (Renold et al., 2015): curriculum design, curriculum application, and curriculum updating. Processes and phases are summarized in Table 2.

Table 2: Phases and processes of VET programs in the KOF EELI
CURRICULUM DESIGN PHASE
Qualification Standards: *Who defines the contents of and standards for qualification?*
Examination Form: *Who gets to decide how, where, and by whom material is tested?*
Involvement Quality: *How many firms are represented? Are intermediary organizations involved?*
CURRICULUM APPLICATION PHASE
Learning Place: *How much time to participants spend at work and in the classroom?*
Workplace Training Regulation: *How are training quality and working conditions ensured?*
Cost Sharing: *Do firms participate in funding classroom and workplace education?*
Teacher Provision: *How many classroom teachers have practical experience?*
Examination: *How much of the exam is practical? Where does it take place? Who is allowed to grade exams?*

CURRICULUM UPDATING PHASE
Information Gathering: *Do surveys measure firms' and employees' satisfaction and success?*
Update Timing: *Who defines when curricula should be revised?*

Strong linkage in the curriculum design phase is based on shared power over defining qualification standards and deciding how mastery should be evaluated, as well as on how many companies can participate in the curriculum design process and how. In the curriculum application phase—or program delivery—there are a number of processes that relate to where students learn, what regulations protect them at work, how costs are divided and shared, and what the examination is like. Finally, in the updating phase, employers need to be involved in information-gathering on graduates and current demand, as well as deciding when to trigger a curriculum update.

Method

We develop an index that measures education-employment linkage, the KOF EELI. It addresses linkage throughout the Curriculum Value Chain at all observable processes where education-system and employment-system actors might come into contact. For more on survey development, see the full report (Renold et al., 2016). We developed a survey to measure the index, and sent the survey to VET experts from the education, employment, and research sectors in the twenty countries identified as top youth labor market or PISA performers (see Renold et al., 2015 for the selection process). The top three from each group make up our six focus countries.

All experts were the highest-ranking individual in their field that focused exclusively on VET issues. Criteria for the various expert types are in Table 3.

Table 3: Expert types and criteria

Expert Types	Individual Criteria
Education	High-ranking officials who work directly on VET… – In all relevant ministries, – At all levels where VET is administered, and – With sufficient English reading skills.
Employment	High-ranking individuals who work directly on VET… – In all bodies involved with VET (those influencing the largest number of students when there are too many) and/or – In bodies filling all roles played by the private sector in VET, and – With sufficient English reading skills.
Researchers	Senior scholars who work directly on VET… – With advanced degrees in relevant fields, – With demonstrable history of research on VET, – In all government research institutes dealing with VET or in top universities, and – With sufficient English reading skills.

In the focus countries, we sent the survey to many experts, and in the non-focus countries only one or two. We focused primarily on education and employment experts, with a small number of researchers in the focus countries, so that we could hear directly from the people involved. In secondary countries, we used mostly research and occasionally education experts. See the full survey and response rates in Table 4. Country abbreviations are in Table A2 in Appendix 1.

Table 4: Expert sample and response rates

Country	Response Rate *(Answer/Ask)*	Respondent Type (%)		
		Education	Employment	Research
Switzerland	57% *(59/103)*	39%	53%	8%
Denmark	47% *(18/38)*	44%	33%	22%
Hong Kong	17% *(15/90)*	47%	40%	13%
Korea	6% *(2/34)*	50%	0%	50%
Netherlands	29% *(10/34)*	50%	30%	20%
Singapore	24% *(16/66)*	63%	31%	6%
Non-Focus Countries				
Austria	100% *(1/1)*	0%	0%	100%
Canada	0% *(0/4)*			
China (Shanghai)	50% *(1/2)*	0%	0%	100%
Germany	50% *(1/2)*	100%	0%	0%
Estonia	100% *(1/1)*	100%	0%	0%
Finland	67% *(2/3)*	50%	0%	50%
Iceland	67% *(2/3)*	100%	0%	0%
Japan	100% *(2/2)*	0%	0%	100%
Lithuania	0% *(0/3)*			
Luxembourg	25% *(1/4)*	0%	0%	100%
Norway	20% *(1/5)*	0%	0%	100%
Poland	33% *(1/3)*	100%	0%	0%
Singapore	100% *(1/1)*	100%	0%	0%
Taiwan	17% *(1/6)*	0%	0%	100%
Total	**33% *(135/405)***	**45%**	**38%**	**17%**

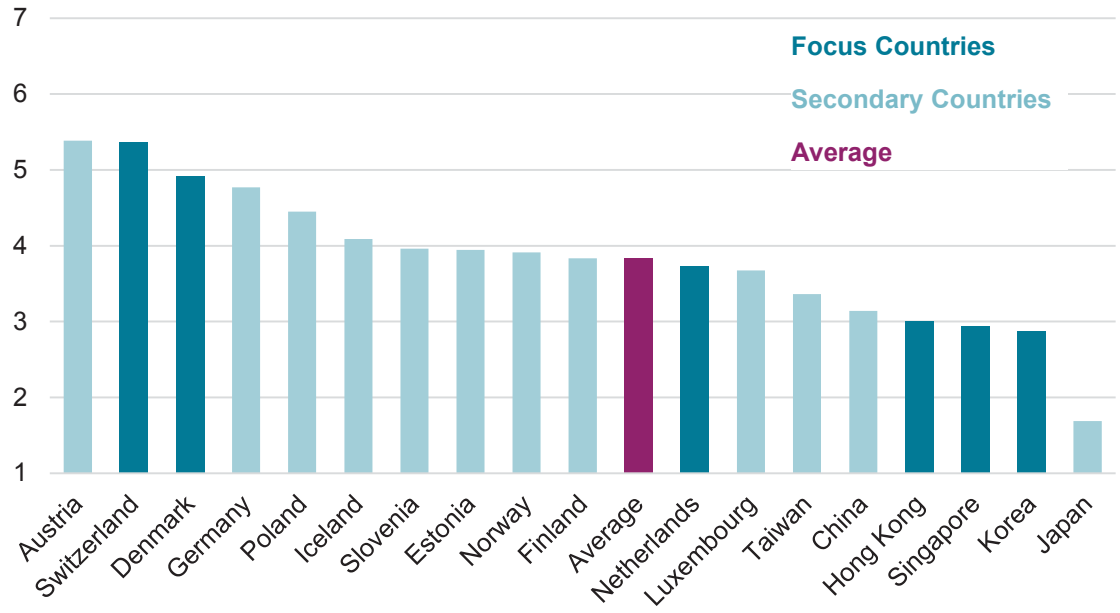
Before conducting the survey, we determined the **largest VET program in each country at the upper-secondary level** using in-country experts, then asked respondents about that program. There is still curriculum variation within programs because they contain different occupations, but they all have the same format. All available VET programs would make up the VET pathway. The full list of VET programs in each country, size of the VET pathway in upper-secondary education, size of the measured program in the VET pathway, and number of occupations in each program are in Table A1 in Appendix 1. The high variation on those characteristics is another reason it would be difficult to compare curriculum content usefully.

The survey asks experts about linkage at the feature and phase levels. Features are pieces of processes, and asking about them directly makes questions concrete and easier for experts to answer. We aggregate those into processes, then phases, then an overall KOF EELI score using the weighting scheme discussed in Renold et al. (2016). We asked about phase-level linkage so that we could construct a weighting scheme that tells us the relative importance of features, processes, and phases for overall education-employment linkage, which is a useful finding in itself.

Findings

Overall KOF EELI scores are on a one-to-seven point scale where seven is the best possible score. Figure 2 shows all scores by country, with focus countries in dark teal and secondary countries—with less reliable data—in light teal. The top-scoring countries are Austria (5.4) and Switzerland (5.4), followed by Denmark (4.9). The average score among these countries is 3.8. The lowest scorers are Hong Kong (3.0), South Korea (2.9), and Japan (1.7). When we later ran the KOF EELI in the state of Colorado, its high school CTE programs scored 2.7.

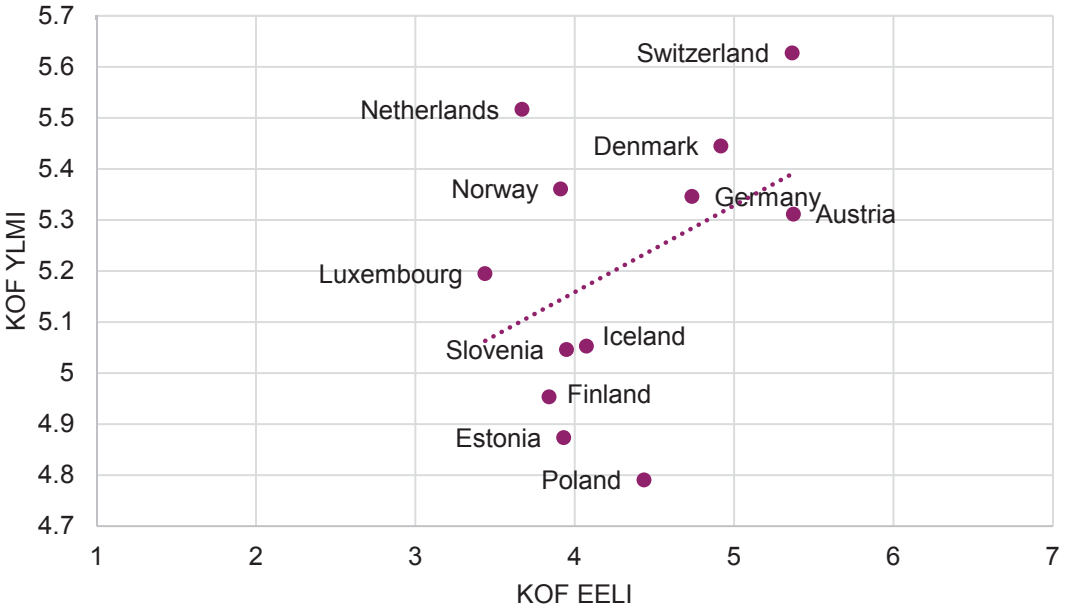
Figure 2: KOF EELI scores by country



We also find that countries with higher KOF EELI scores have better youth labor market situations as measured by the KOF Youth Labor Market Index[1] and shown in Figure 3. That index looks not only at unemployment, but also at other measures of young people's activity state, working conditions, education matching, and transition smoothness. The correlation, however, is not quite significant due to small sample size and only applies to countries that report enough data for the KOF YLMI.

[1] https://www.kof.ethz.ch/en/forecasts-and-indicators/indicators/kof-youth-labour-market-index.html

Figure 3: Countries with better KOF EELI scores have better youth labor market situations



Key characteristics

Because the KOF EELI includes a weighting scheme derived from the answers of experts, we can tell which features, processes, and phases are most important for strong VET programs. The key characteristics of the best programs are these:

Key Characteristics of Strong VET Programs

Employers involved in:

- Setting qualification standards,
- Deciding when to update,
- Setting the examination form.

Students spend most of their time in the workplace instead of the classroom.

Table A2 in Appendix 1 includes the entire weighting scheme. The most important phase is the curriculum design phase (41.9%) followed closely by curriculum application (34.4%) and the curriculum updating (23.7%). Among processes, the most important by far is update timing: employers must be able to say when the curriculum of a VET program needs a change (22.5%). Other important processes are involvement in defining qualification standards (15.8%) and in deciding how the examination should work (11.8%). Features are similar to processes, led by employer involvement in deciding qualification standards (15.8%), in deciding when to update (15.7%), and acting as the learning place the majority of the time (13.2%).

The feature level asks specific questions about the VET system. The most important features are summarized in Table 5, and used in our examples of VET system types in the next section.

Table 5: Key features of linkage and their weights in the KOF EELI

Feature	Weight (%)*
CURRICULUM DESIGN PHASE	
Do companies help define curriculum content and standards for VET?	15.8
Do companies help define how VET exams work?	11.8
Are companies involved in VET both individually and through associations?	4.0
Is companies' role in VET curriculum design legally defined?	10.2
CURRICULUM APPLICATION PHASE	
How much learning takes place in workplaces?	13.2
Do students have contracts when they work?	1.7
Is the training curriculum implemented?	6.9
Do companies help pay for offsite VET education?	1.5
Do teachers have industry experience?	3.2
Can trainers give exams and/or grades?	7.7
CURRICULUM UPDATING PHASE	
Do companies help decide when to update VET curricula?	15.7
Is companies' role in VET curriculum updating legally defined?	6.7

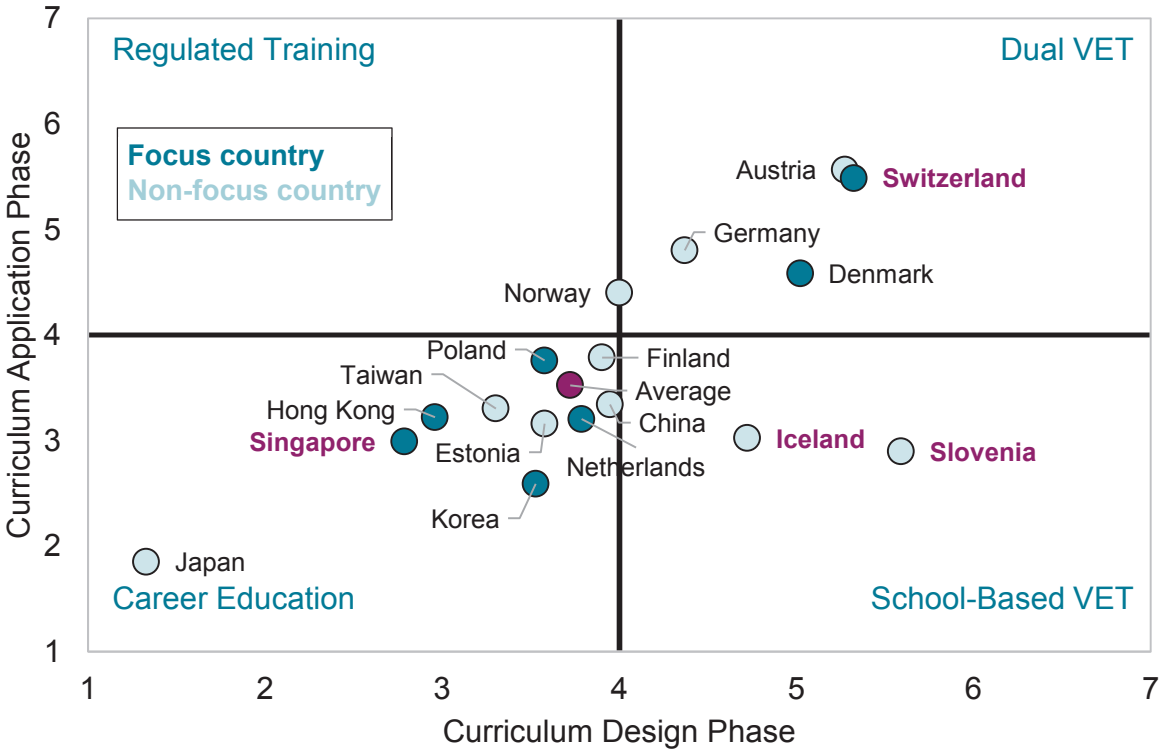
**Note: These do not sum to 100% because we omit features with less than 1% weight*

This is all in line with the research in the field, but the KOF EELI version lets us quantify relative importance and help policymakers prioritize. As an example of how this information can help prioritize effort for VET, we demonstrate a categorization strategy and how it applies to four case study countries in the next section.

Applying the KOF EELI

We can use the two most important phases of the KOF EELI—the curriculum design phase and curriculum application phase—to create a four-quadrant categorization model. In Figure 5, we simply plot our 20 countries on these axes. We will choose one country from each quadrant—usually a focus country with the highest number of responses for the best data—to explore strengths, weaknesses, and policy priorities. Rageth & Renold (forthcoming) develop the theoretical framework for typology of VET systems, this draws on that work.

Figure 5: Categorizing countries according to design and application scores



Countries in the top right "Dual VET" quadrant are the strongest performers, with high scores in both phases. These include Switzerland, which we will use as an example to explore its detailed KOF EELI scores and potential policy choices.

The bottom-right quadrant, "School-Based VET" is for programs that are strong in the curriculum design phase but have low linkage in the curriculum application phase. No focus countries are in this group, so we will profile both Iceland and Slovenia briefly.

The top-left quadrant, "Regulated Training" does not contain any of the programs profiled here. Part of the reason is that these programs are based in companies, not in the education system. These are on-the-job training programs where there is some education-system or at least government involvement in setting the curriculum so it is not too firm-specific. An example might be the American Registered Apprenticeship program.

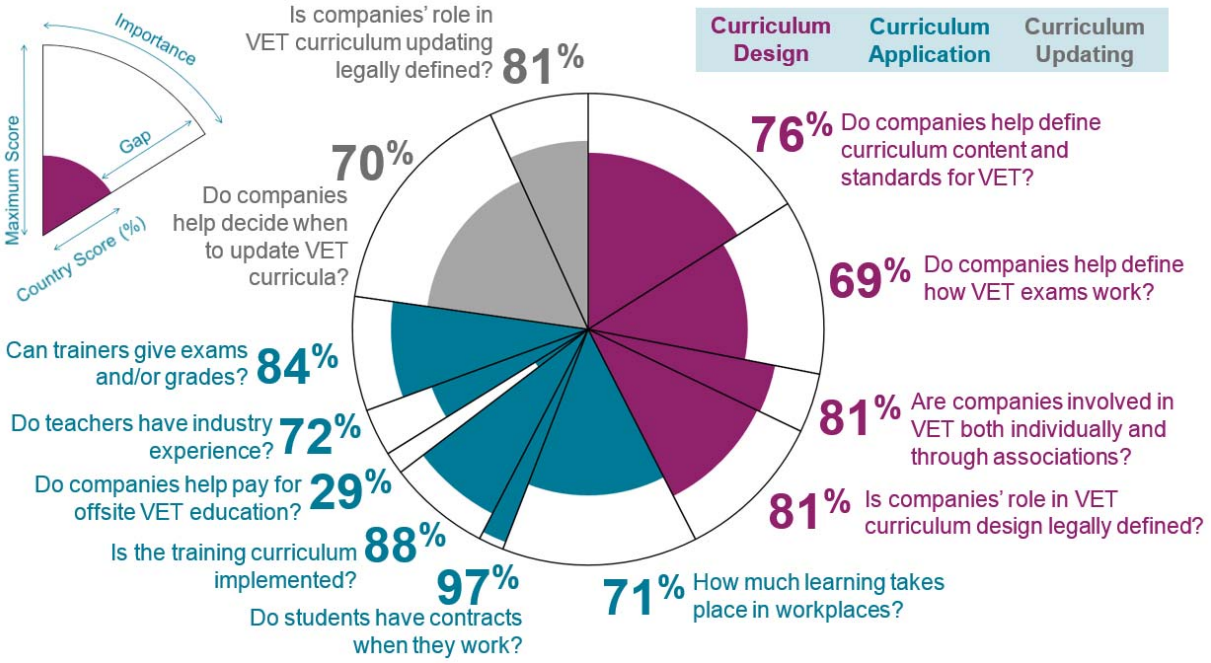
Finally, the bottom-left quadrant is "Career Education" and includes programs that consider themselves VET but have low linkage to employment in both design and application. American high school CTE falls into this group, according to our Colorado study (Renold, Caves, Bolli, & Buergi, 2016). We will use Singapore as the example for this quadrant, since its largest program was in this quadrant in 2016 when we ran the survey.

Dual VET - Switzerland

The Swiss system is famously one of the strongest in the world. In this study, it has the highest score out of focus countries with reliable data, and its system is considered the gold standard for upper-secondary VET (Hoffman & Schwartz, 2015). The program we evaluate here is its **Dual Apprenticeship** program, which serves 72.5% of each cohort in 230 occupations. Students spend 60-80% of their time in workplace learning under work contracts, in both the classroom and the workplace every week. Most of the program's content is transferrable.

Overall, Switzerland scores very well on the KOF EELI. It has consistently strong scores for all of the important features included in the chart. Switzerland's lowest score is for one of the least-important features, at only 29% of the ideal score for "Do companies help pay for offsite VET education?" Indeed, Switzerland's dual VET system is so strong that it would not make sense for companies to pay what they are already providing. The country's strongest scores are in training curriculum implementation and work contracts for apprentices, at 88% and 97% respectively.

Figure 6: Swiss feature chart relative to the maximum



Reading guide for figures in this section

The figures show a pie chart of feature weights, where the **larger slices are more important** for linkage. Colored wedges—pink for the curriculum design phase, teal for curriculum application, and grey for curriculum updating—show how the country scores relative to the maximum. **The diameter of the colored wedge is scaled according to the country's score on that feature**. The **percentages outside the circle show the exact score relative to the ideal**, and the **text blocks explain the feature** in question. An ideal chart would be full-color, and the worst would be completely white.

In the three most important features—defining curriculum content, workplace learning, and update timing—Switzerland has strong scores. The less-important features are mixed. This indicates that the country is placing its policy priorities where they belong: the most important parts of linking education to employment and therefore ensuring high-quality VET with positive labor market outcomes are the ones where Switzerland shines.

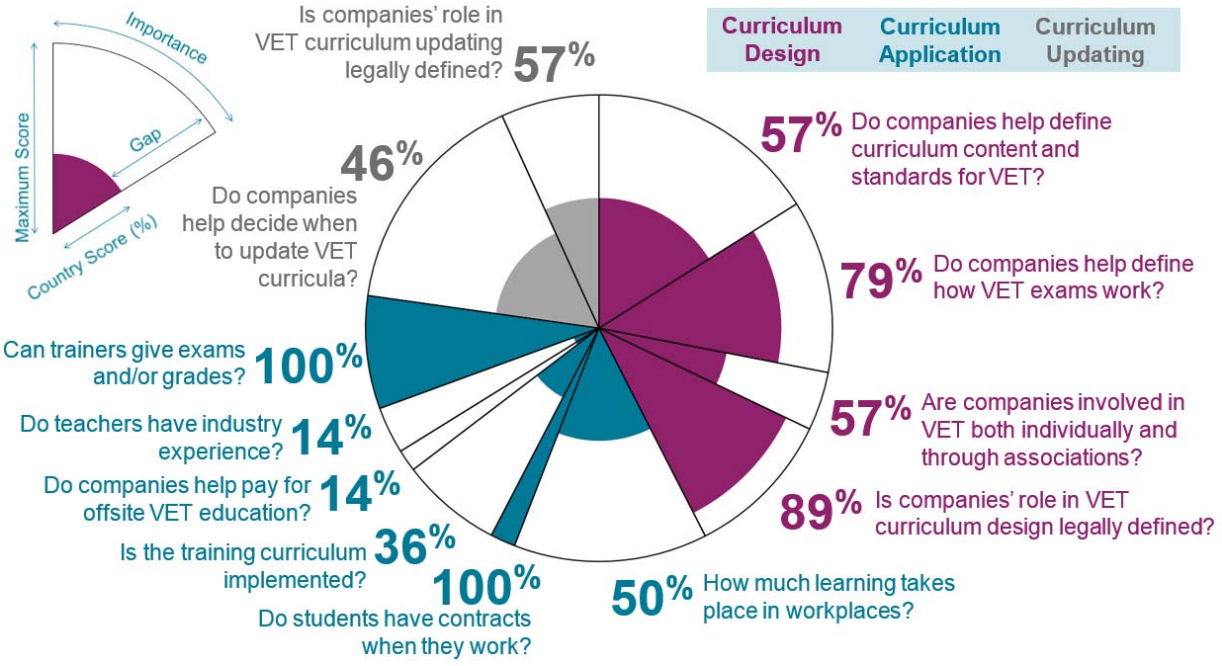
Other countries in this quadrant are similar. Austria, Germany, and Denmark are all well known for their VET systems and strong youth labor markets. Countries with “Dual VET” programs are already far ahead in the right direction. Since the precise optimum for linkage is not yet clear, we have no reason to say that these countries must strive to hit 100% in every feature. Indeed, the areas where these strong countries have the lowest scores might be the best places for us to start revising the KOF EELI as we gather more data.

School-based VET - Iceland & Slovenia

School-Based VET programs have high linkage in the design phase but not the application phase. The examples for this type are Iceland and Slovenia. Neither is a focus country, so we will take the two together to minimize data issues.

Iceland’s Apprenticeship Program lasts between one and four years, with students alternating periods of work- and school-based learning but spending most of their time at school. The program enrolls 32.7% of each cohort, and offers 12 fields of study. When they are at work, apprentices have a contract, though it is unclear how much content is transferable.

Figure 7: Icelandic feature chart relative to the maximum



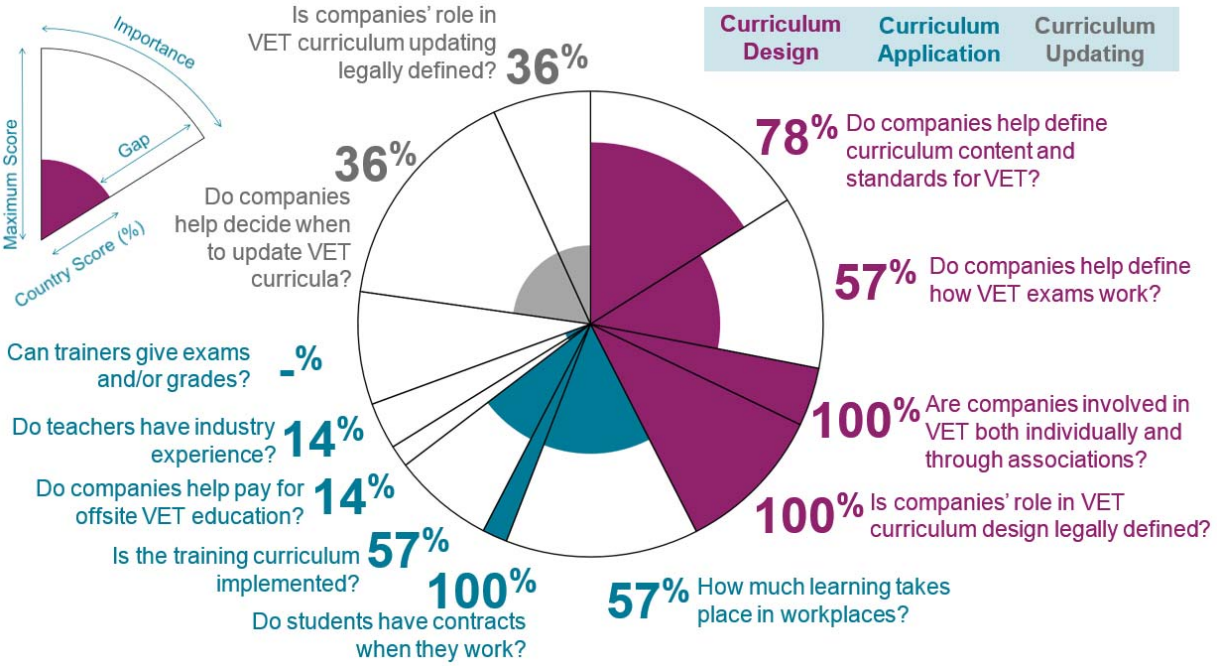
Iceland's strengths are trainers giving exams, work contracts, legal definitions for companies' roles in curriculum design, and companies' role in defining the examination form. This indicates a strong regulatory framework. Iceland's weakest points are that teachers do not have industry experience, companies do not contribute to offsite education costs, and the training curriculum is not reliably implemented. This indicates a disconnect between students' experiences and real occupational experience.

On the three most important features, Iceland has moderate scores. For companies defining curriculum and standards (57%), workplace learning (50%), and update timing (46%), Iceland's education- and employment-system actors do not appear to be strongly linked. Overall, there is a somewhat disjointed pattern of strengths and weaknesses, with the most consistency in the curriculum design phase.

Slovenia's Technical Upper Secondary program lasts four years and, like Iceland, has students alternating periods of work- and school-based learning with most time spent at school. The program enrolls 59.7% of each cohort, and offers 48 occupations. The majority of program content is specific rather than transferable.

Slovenia's strengths are companies' involvement quality (100%), legally-defined role in curriculum design (100%), and role in defining curriculum content (78%). It's weaknesses are teachers with industry experience (14%), companies paying for offsite education (14%), and both features of the curriculum updating phase (36%). It does not have a score for whether trainers can give exams.

Figure 8: Slovenian feature chart relative to the maximum



On the three most important features, Slovenia is very mixed. It scores well on defining curriculum and standards (78%), medium for workplace learning (57%), and poorly for update timing (36%). Like Iceland, Slovenia is a mixed group of scores with a wide range and the strongest scores in

curriculum design. However, Slovenia's chart shows much lower scores outside the curriculum design phase.

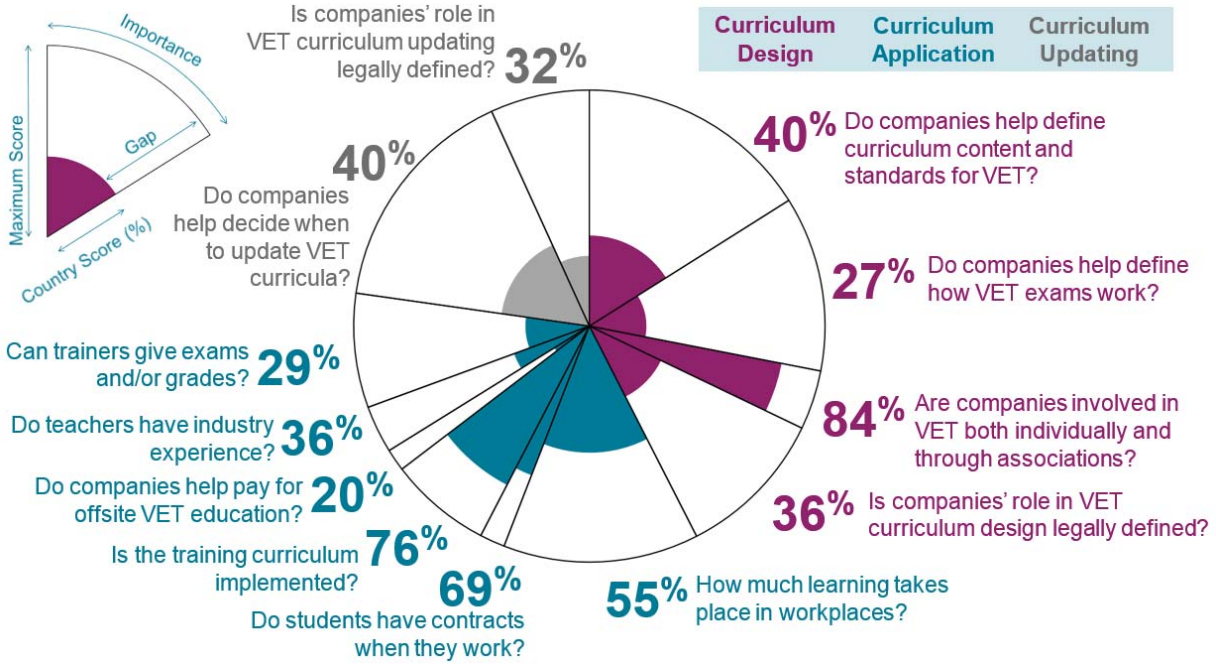
Countries in this quadrant have much of the regulatory framework and contact processes between education and employment already in place, but do not prioritize workplace learning in their VET programs. These countries can greatly improve their education-employment linkage and youth labor market outcomes by increasing the time students spend in workplace learning. Both Iceland and Slovenia already have some workplace learning, it is simply not enough to pay off for the education system by lowering costs, for employers by enabling them to recoup training costs, or for students by giving them the experience they need to find quality jobs.

Career education – Singapore

Unlike the School-Based VET quadrant, the Career Education quadrant is based almost entirely in the education system. While employers might be consulted or serve on oversight boards, the system is fundamentally in the hands of the government or the employment system. Singapore's 2016 model is an example of such a system. This case is especially interesting because Singapore is currently reforming its system, so a re-measurement later is likely to show improvement.

Singapore's Institutes of Technical Education are actually more like tertiary programs, but were recommended to us as the appropriate program by experts in that country. The program lasts two years and enrols 25% of all post-secondary students in 97 occupations. While students have a work contract, the program is mainly classroom education and workplace learning is usually only after classroom learning is over. According to experts, the program is mostly non-transferable content.

Figure 9: Singaporean feature chart relative to the maximum



Singapore's highest scores are for companies' involvement quality (84%), training curriculum implementation (76%), and work contracts (69%). This indicates a strong regulatory framework. Its lowest features are companies paying for offsite education (20%), companies' role in defining exams (27%), and trainers' ability to grade or give exams (29%). That indicates the education system is not willing to give up control on what it sees as its own turf, and severely undermines the potential power of employers in VET.

On the three most important features, Singapore's scores are low to medium. Its best is workplace learning, scoring 55% relative to the average. However, companies' role in update timing and in defining curriculum content are both only 40%. Again, Singapore demonstrates a situation where the education system wants to work with employers, possibly hear their opinions, and even perhaps have them sign off on curricula or give their ideas. However, when the time comes to choose an option or deliver a program to a student, the education system holds fast to power.

Other countries in the Career Education quadrant likely have similar experiences. American high school CTE falls into this category, based on a study we did using the KOF EELI in Colorado (Renold, Caves, Bolli, & Buergi, 2016). In that case as in Singapore, the most important features were the ones with the lowest scores. In Colorado more so than Singapore, the effort to improve VET had resulted in some high scores—but in low-impact features. Countries with low linkage and struggling VET systems are likely to want to improve, but changing low-impact parts of the system is only a good way to waste energy and lose momentum when results fail to materialize.

Singapore is currently engaged in reforms specifically trying to address the insufficient role for employers in its entire VET system including the Institutes of Technical Training. As the system changes over time, its KOF EELI score and the shape of its chart will change. The KOF EELI is, in this case, a measurement of where the system stands so leaders can identify the best possibilities for reform, so any system from any starting point can improve and meaningfully impact youth labor market outcomes.

Regulated training - Discussion

None of the programs we evaluate are classified as Regulated Training types. These would be programs where there is employer engagement in the application phase, but not the design phase. Essentially, employers would be delivering a pre-written curriculum under a regulatory framework that protects participants.

Initially, it is hard to understand why employers would agree to do this: employers tend to resist generality, preferring to train firm-specific skills when they are the ones in charge. However, if the education system or government is investing in curriculum development and regulation, they might also invest in subsidies that encourage employers to participate. The research is heavily skeptical of training subsidies paid directly to companies (Muehlemann & Wolter, 2014)), but they could entice companies to train.

One likely example of a Regulated Training program is the American Registered Apprenticeship program. Companies train according to occupational curricula, and usually are compensated either directly or through lower wages for their efforts. Programs like this can be very successful as labor market integration strategies for struggling individuals, but are not part of the broader

education system. As a result, it is not easy to identify clear entry and exit conditions, or to proceed from the apprenticeship to further education.

From a curriculum point of view, a program where employers deliver the program but do not help design it is likely to lead either to noncompliance or obsolescence. Employers know when a curriculum needs updating and what needs to go into a redesign well before education-system actors, so they would either have to deviate from the curriculum in their training or have a role in the design process. While Regulated Training programs might work for labor market integration and subsidized job training, they are not likely to be sustainably up-to-date, cost effective, or a first-choice option for participants.

Conclusions

This study does not directly compare the contents of VET program curricula. Because of the peculiarities of VET, that would be irrelevant at best and highly misleading at worst. Instead, we develop the KOF EELI, which measures education-employment linkage throughout all processes involved in a VET program. Using the overall KOF EELI index score, we can say that countries with dual VET have the highest scores, while those where schools maintain their hold on power over curriculum design, application, and updating have the lowest scores. Among the focus countries, Switzerland and Denmark are the leaders, while Hong Kong, Singapore, and South Korea are further behind.

We can also compare the KOF EELI to youth labor market outcomes, finding that the best-linked systems also have better youth labor markets according to the KOF YLMI. Further data collection would be useful, or a state-level American study where we can compare similarly-reported statistics across states large enough to be their own labor markets.

We can use the data to explore four types of VET: Dual VET programs are the strongest, and engage employers through all processes. School-Based VET programs have engage employers on some of the most important VET processes, but also tend to expend effort in less important areas while missing critical steps like expanded workplace learning. Career Education programs have a work-oriented focus, but are at heart education programs. These expend a great deal of effort on the least impactful forms of education-employment linkage while keeping power over the most critical issues firmly with the education system. Finally, though none of the countries studied here have Regulated Training programs, those are likely to be low-quality or unsustainable.

The KOF EELI clearly demonstrates that there are more- and less important areas of intervention for improving VET systems. This is the first iteration of the tool and it has limitations that we look forward to minimizing with more data and further refinement, but it already reaffirms the research in the field in many ways. There are a large number of features associated with strong VET programs, and policymakers need to know which the best points of entry are if they are going to successfully improve youth labor market outcomes through VET reform.

How to use the KOF EELI

An evidence-based policy strategy

The KOF EELI can be a very useful tool for policymakers because it lets them productively learn from the best systems while giving them priorities for where to start in their own reforms. We outline the process we recommend and provides examples using Switzerland and the state of Colorado.

Evidence-Based Policy Strategy

1. **Identify problem areas** using KOF EELI results
2. **Present results to large groups** to raise awareness
3. **Brainstorm ideas** with smaller groups of key stakeholders
4. **Make a plan** to initiate reform
5. **Implement reform**, using results to keep momentum
6. **Measure progress** using KOF EELI and outcomes

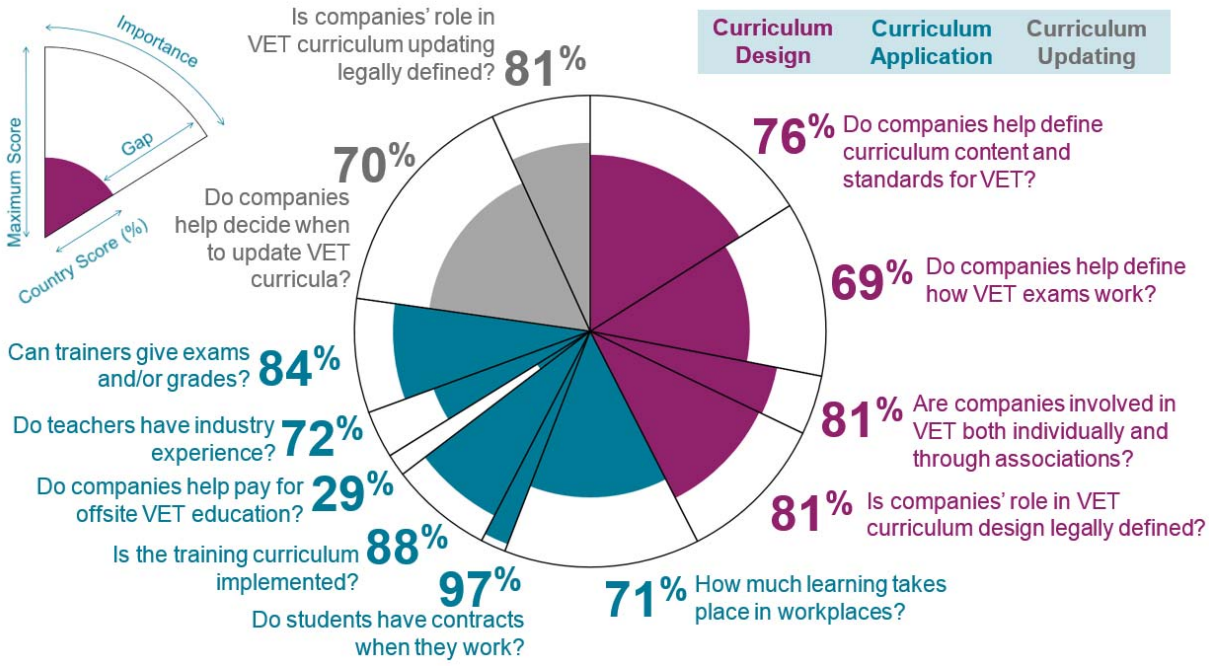
Example A: Switzerland

Though the Swiss system is strong, it is not without areas for improvement. With a total KOF EELI score of 5.37 out of 7, there are areas where the Swiss Dual Apprenticeship program can better meet the needs of participants, companies, and the economy.

1. **Identify problem areas** using KOF EELI results

Figure A shows Switzerland's KOF EELI scores on the key features of linkage. We use this image instead of scores alone because our strategy is to look for the largest areas of white space, not the lowest scores. The largest such area is under "Do companies help decide when to update VET curricula," followed by "Do companies help define how VET exams work?" and "How much learning takes place in workplaces?" Our focus for this exercise will be on companies' role in VET curriculum updating. Note that we do not focus on the lowest score—29% for "Do companies help pay for offsite VET education?"—because that feature is so low-weighted as to create hardly any white space in the figure.

Figure A: Swiss feature chart relative to the maximum



2. **Present results to large groups** to raise awareness

If Switzerland wants to increase companies' role in deciding when to update VET curricula, people involved in the system need to know about the problem and the goal. KOF EELI results are very useful for raising awareness because they are concrete and quantitative. Stakeholders can easily see the weakness—and easily understand why this problem is the focus of reform and not others.

In Switzerland, we have already presented these results at forums and events where members of the public can hear from our researchers what the problems are and why this one is critical. We publish the results online and wrote a short article for major newspapers. This step starts a discussion on what needs to happen, and starts to get people on board with upcoming changes.

3. **Brainstorm ideas** with smaller groups of key stakeholders

While the general public might start to contribute ideas during step two, it is small groups of key stakeholders that are needed to develop a set of ideas for fixing the problem. Stakeholders need to include representation of students, parents, schools, education governance, and critically companies and employer associations.

While education-system actors might think they should be the ones setting a schedule for curriculum update, companies are likely to have strong feelings as well. Because only companies can feasibly be aware of technological, process, and demand changes in their own industries, it makes sense that they should be the ones to initiate the curriculum update process. Small groups can field ideas for better strategies.

4. **Make a plan** to initiate reform

Based on the results of discussions with small stakeholder groups, the reform team can develop a plan for change. This process is likely to be iterative, with reformers collecting ideas, developing plans, checking those plans with stakeholders, and collecting more ideas for improvement. Once there is a plan, the reform team can move on to implementation.

The platform for discussion created by the KOF EELI is critical to the plan being one upon which all stakeholders can agree. Without unity around the problem and general awareness, stakeholders—especially from the employment system—might not make time to attend meetings or might be unwilling to listen to actors from other systems. The emphasis of the KOF EELI on decision-power-sharing and collaboration helps force relevant parties to come together.

5. **Implement reform**, using results to keep momentum

Implementation is a long and complex process, but having awareness of the problem, momentum from public opinion, and agreement from key stakeholders will certainly help. The reform team can maintain momentum through the process by using KOF EELI results to remind everyone why the project is important.

6. **Measure progress** using KOF EELI and outcomes

As the reform progresses or after it is finished, the KOF EELI can be applied again to measure concrete change in the VET program. Reforms benefit from being able to report clear progress, and the system benefits from addressing the most important concerns first.

Since KOF EELI scores are related to youth labor market outcomes, progress can also be measured on dimensions of the youth labor market situation in the affected area. The KOF Youth Labor Market Index measures 12 features in dimensions for activity state, working conditions, education, and transition smoothness.[2] In Switzerland's case, the main benefactor of a reform to increase employers' role in update timing is likely to be transition smoothness, with young people moving more easily from school to work since their qualifications reflect in-demand skills and competencies. Of course other dimensions like skills mismatch and the long-term unemployment rate and the index as a whole are likely to improve, so reformers can track progress on their reforms and assess impact.

[2] https://www.kof.ethz.ch/en/forecasts-and-indicators/indicators/kof-youth-labour-market-index.html

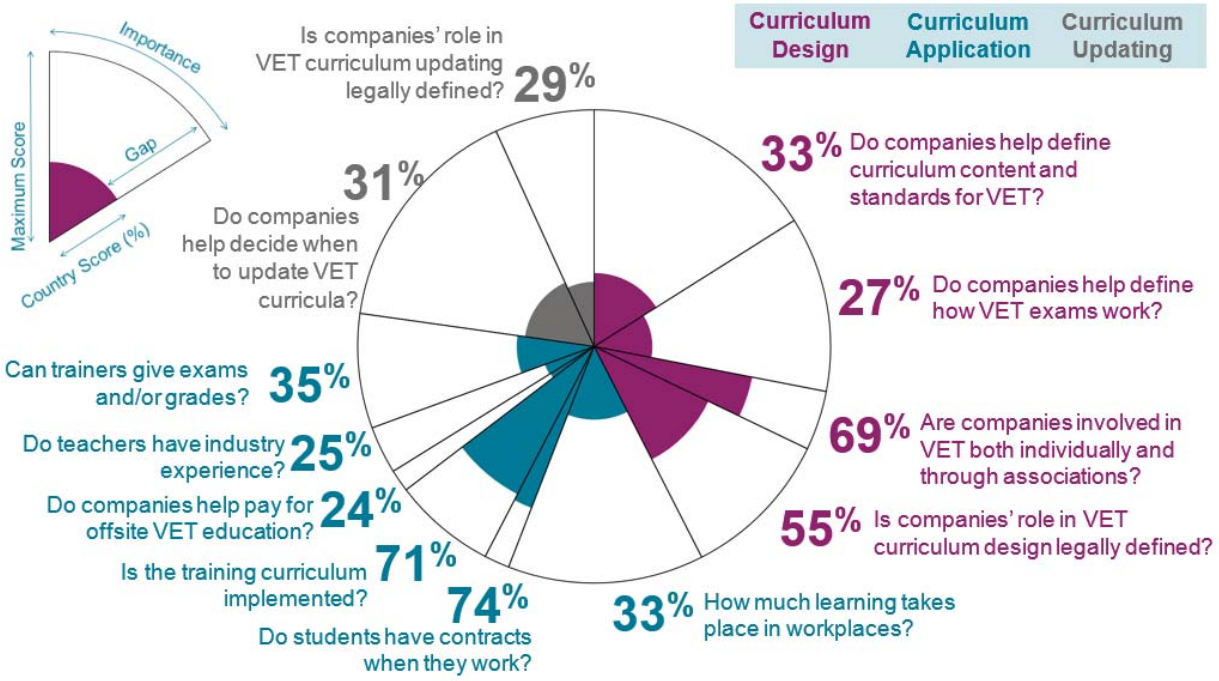
Example B: Colorado

We did a KOF EELI study in Colorado through our partnership with CareerWise Colorado[3], and can provide some insights into how the process might work in an American context where the collaboration between education- and employment-system actors is not as well established. See Renold, Caves, Bolli, and Buergi (2016) for the full study. In this case, the KOF EELI's utility as a platform for discussion is even higher.

1. **Identify problem areas** using KOF EELI results

Figure B shows Colorado's KOF EELI scores on the key features of linkage. With an overall KOF EELI score of 2.7, Colorado's High School CTE program has much less linkage between actors from the education and employment systems than Switzerland's. The challenge in Colorado is figuring out where to intervene first, to avoid wasting effort on low-impact interventions.

Figure B: Colorado feature chart relative to the maximum



There is a great deal of white space in Figure B, but for Colorado the three highest-impact features—employer engagement in curriculum design, workplace learning, and employer decisions over curriculum updates—are some of the lowest scores so they are an obvious choice for intervention. There are others, like the low score for companies' role in deciding how VET exams work, their right to give grades, and their legal status in curriculum updating. However, Colorado reformers will have the greatest impact by focusing on a few key features first—and those features may bring other parts of linkage along with them.

[3] http://www.careerwisecolorado.org/

2. **Present results to large groups** to raise awareness

The first step will be informing people, educators, governance actors, and employment-system actors in Colorado that there is a specific problem. Colorado's employers especially are already aware that their skills needs are not being met (see Renold, Bolli, Caves, & Buergi, 2017). The youth labor market is not ideal, and high schools are already eager to implement new programs like CareerWise Colorado's project. However, the general public is not yet aware of the concrete problems within the broader issue of missing VET in the state.

The KOF EELI can start discussions about what needs to happen in Colorado. Clearly the linkage between education- and employment-system actors is too low, but these results indicate concrete areas where changes can and should be made. Colorado's highest scores are in regulatory areas—students have workplace learning contracts and training curricula—when they exist—are implemented. However, the most important areas are severely lacking. Colorado's reformers can make a strong case for improving company engagement in curriculum design, radically increasing workplace learning, and letting companies trigger VET curriculum updates. These are the key areas for raising Colorado's KOF EELI score.

3. **Brainstorm ideas** with smaller groups of key stakeholders

The changes in Colorado are not trivial. Increasing company engagement in curriculum design means educators have to set aside familiar processes for developing curricula and listen to the employer point of view. Employers are more likely to think in terms of competencies, situations, and processes. Curriculum designers will need to break this information down into skills, allocate them across learning locations, then rebuild the curriculum. That process is in stark contrast to the subject-oriented strategy of adding and subtracting blocks of classroom teaching.

Similarly, workplace learning will require ideas and consideration from multiple stakeholders. When time is taken away from classroom learning, how will priorities be reallocated? For what content can employers be held responsible? What oversight, quality control, and trainer-training measures will need to be taken? Employers' role in triggering curriculum update is similar: how should employers communicate that curricula are in need of updating? What is the decision process? What happens first when an update begins?

Once the scope of reform is narrowed to specific features, the questions that will arise become clear and the need for multi-stakeholder perspectives is obvious. The KOF EELI can demonstrate where reformers should focus to structure discussions, and which features of strong VET systems are not priorities at first.

4. **Make a plan** to initiate reform

As in the Swiss example, Colorado's reformers need to come up with a plan that addresses their specific concerns and incorporates the ideas of stakeholders from small-group meetings. The process will again be iterative, and will be a critical chance for actors unused to collaboration to find a strategy for working together. Because there should already be momentum from the general public to improve high school CTE and buy-in from stakeholders thanks to meetings, it should be possible to arrive at a plan for a pilot project that improves linkage.

5. **Implement reform**, using results to keep momentum

Colorado has a relatively long way to go, so it will need to start small and build. New programs will start as pilot projects in a few occupations and a few locations, then grow to include more students, more schools, more employers, and eventually more occupations. The project will not be easy and will inevitably run up against opposition, but the KOF EELI creates an international comparison of VET systems that actually enables change while demonstrating that Colorado has a great deal of room to improve. International comparisons are a strong tool for motivating reform efforts, but without specific applicability they risk generating only resentment and defensiveness. The KOF EELI includes a plan and a set of priorities, which can help Colorado's reformers keep going.

6. **Measure progress** using KOF EELI and outcomes

One advantage to having such a long way to go is that Colorado is likely to see initial progress relatively quickly. There is so little education-employment linkage and so little role for employers in the high school CTE program that any improvement will be impactful. Colorado can iterate the reform process itself by repeating these steps: after one improvement, reformers can identify the new sources of white space in the figure above, then systematically reduce the worst offenders until the picture is much more colorful. Simultaneously, they should keep an eye on youth labor market outcomes to determine which reforms are most effective and impactful for Colorado.

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Appendix 1: Tables

Table A1: Upper secondary VET programs and enrollment by country			
Country **Main** Program(s)	VET (% of all upper secondary)	Program (% of VET)	Number of curricula/ qualifications
Focus Countries			
Denmark[4]	45%		111 w/ 301 steps & concentrations
EUD Program		**99.4%**	
EUX Program		0.6%	
Hong Kong[5]	7%		46 Occupations
Diploma in Vocational Education (DVE)		**71.4%**	
Other VET programs		28.6%	
Netherlands[6]	67%		176 with 489 profiles
MBO BOL		**75%**	
MBO BBL		25%	
Singapore[7] *(tertiary – see case study)*	65%		97 Nitec/Higher Nitec
Institute of Technical Education (ITE)		**38.5%**	
Polytechnic & Polytechnic Foundation Program		61.5%	
South Korea[8]	17.6%		5 Main specializations
Vocational High Schools		**95.5%**	
Meister High Schools		4.5%	
Switzerland[9]	72.5%		230 Occupations
Dual VET (Apprenticeship)		**89.8%**	
School-based VET		10.2%	
Secondary Countries			
Austria[10]	80%		206 Occupations
Apprenticeship (Dual System)		**50.4%**	
VET College (BHS)		32.4%	
VET School (BMS)		17.2%	
Canada[11]	-		Unknown
VET programs at secondary schools		**100%**	

[4]CEDEFOP (2014a); Statistics Denmark (2016)
[5]VTC (2016).
[6]Eurostat (2016); MoECS (2014a)
[7]Singapore's main VET programs are post-secondary; for more information see the Singapore case study. Sources: KOF Swiss Economic Institute (2015a); Loi, S. (2015); ITE (2015)
[8]Choi (2014)
[9]Data of 2012 from SERI (2015)
[10] CEDEFOP (2012a)
[11] CMEC (2008)

Estonia[12]	28%		657 Occupations
School-based VET		**90.6%**	
VET based on compulsory education		6.9%	
VET without compulsory education		2.5%	
Finland[13]	~40%		8 Fields of study
School-based VET		**69.4%**	
Competence-based VET qualifications		20.6%	
Apprenticeship training		10.0%	
Germany[14]	51.5%		328 Occupations
Apprenticeship (Dual)		**63.4%**	
Full-Time Vocational School		36.6%	
Iceland[15]	32.7%		12 Fields of study
VET Apprenticeship		**89.6%**	
VET without Access to HE		10.0%	
VET with Access to HE		00.4%	
Japan[16]	24.2%		8 School types
Specialized High Schools (vocational)		**78.2%**	
Comprehensive High Schools		21.8%	
Specialized High Schools (Dual VET Experiments)		Negligible	
Lithuania[17]	26.8%		10 Sectoral standards
School-based VET		**Main**	
Apprenticeship		Negligible	
Luxembourg[18]	68%		7 Occupations
Technical Secondary School-Leaving Diploma		**45.6%**	
Technician's Diploma (Dual)		25.5%	
Vocational programs (Dual)		28.9%	
Norway[19]	52%		~ 180 occupations
Apprenticeship (2+2 System)		**72.8%**	
School-based VET		27.2%	
Poland[20]	56.5%		200 Occupations
School-based VET		**72.4%**	
Basic vocational (partly dual)		25.9%	

[12] These programs provide access to HE; Source: CEDEFOP (2014b); Kerem (2012)
[13] CEDEFOP (2014c)
[13] CEDEFOP (2014c)
[14] CEDEFOP (2012b)
[15] CEDEFOP (2014d); OECD (2013)
[16] Ichimi, M. (2012); MEXT (2016); Comprehensive High Schools combine general and vocational curricula.
[17] CEDEFOP (2014e)
[18] CEDEFOP (2015); CEDEFOP (2012d)
[19] CEDEFOP (2014f)
[20] CEDEFOP (2014g). Supplemental Technical Secondary program exists only until 2015.

Special job training		01.5%	
Supplementary technical secondary		00.1%	
Shanghai[21]	43%		270 Occupations
Vocational Schools		**100%**	
Slovenia[22]	59.7%		48 Occupations
Technical Upper Secondary (School-Based)		**65.4%**	
Vocational Upper Secondary (Dual)		24.6%	
Vocational-Technical Upper Secondary		07.7%	
Short VET (Dual)		01.6%	
Vocational *Matura* Course		00.7%	
Taiwan[23]	47.9%		Unknown
Senior Vocational High Schools		**Main**	
VET at Comprehensive Senior High Schools		Less	
Professional Programs		Less	

[21] OECD (2010):)
[22] CEDEFOP (2014j)
[23] MOE Taiwan (2012); MOE Taiwan (2013)

Table A2: Final weighting scheme			
Phase Process Feature	Weight (% of total index)		
Curriculum Design Phase	41.9		
Qualification Standards		15.8	
Qualification Standards: Involvement			15.8
Qualification Standards: Decision Power			0.0**
Examination Form		11.8	
Examination Form: Involvement			11.8
Examination Form: Decision Power			0.0**
Involvement Quality		14.3	
Career vs Occupation vs Job			0.0**
Firms vs Employer Associations			4.0
Represented Firm Share			0.1
Legal Def. of Involvement			10.2
Curriculum Application Phase	34.4		
Learning Place		13.2	
Classroom vs Workplace Share*			13.2
Legal Def. of Share			0.0**
Workplace Training Regulation		8.6	
Work Contract			1.7
Workplace Training Curriculum: Existence			0.0**
Workplace Training Curriculum: Implementation			6.9
Legal Def. of Workplace Trainer*			0.0**
Cost Sharing		1.5	
Cost Sharing Classroom Education			1.5
Cost Sharing Workplace Training			0.0**
Equipment Provision		0.0	
Employer Share Equipment Provision*			0.0**
Teacher Provision		3.2	
Classroom Education Provision by Employers*			3.2
Examination		8.0	
Practical Share of Examination			0.0**
Practical Examination*			0.3
Practical Examination Experts*			7.7
Curriculum Updating Phase	23.7		
Information Gathering		1.2	
Employer Surveys			0.7
Labor Force Surveys			0.5
Update Timing		22.5	
Employer Involvement			15.7
Legal Def. Employer Involvement			6.7
Total	100% *Dimensions*	100% *Sub-dimensions*	100% *Features*

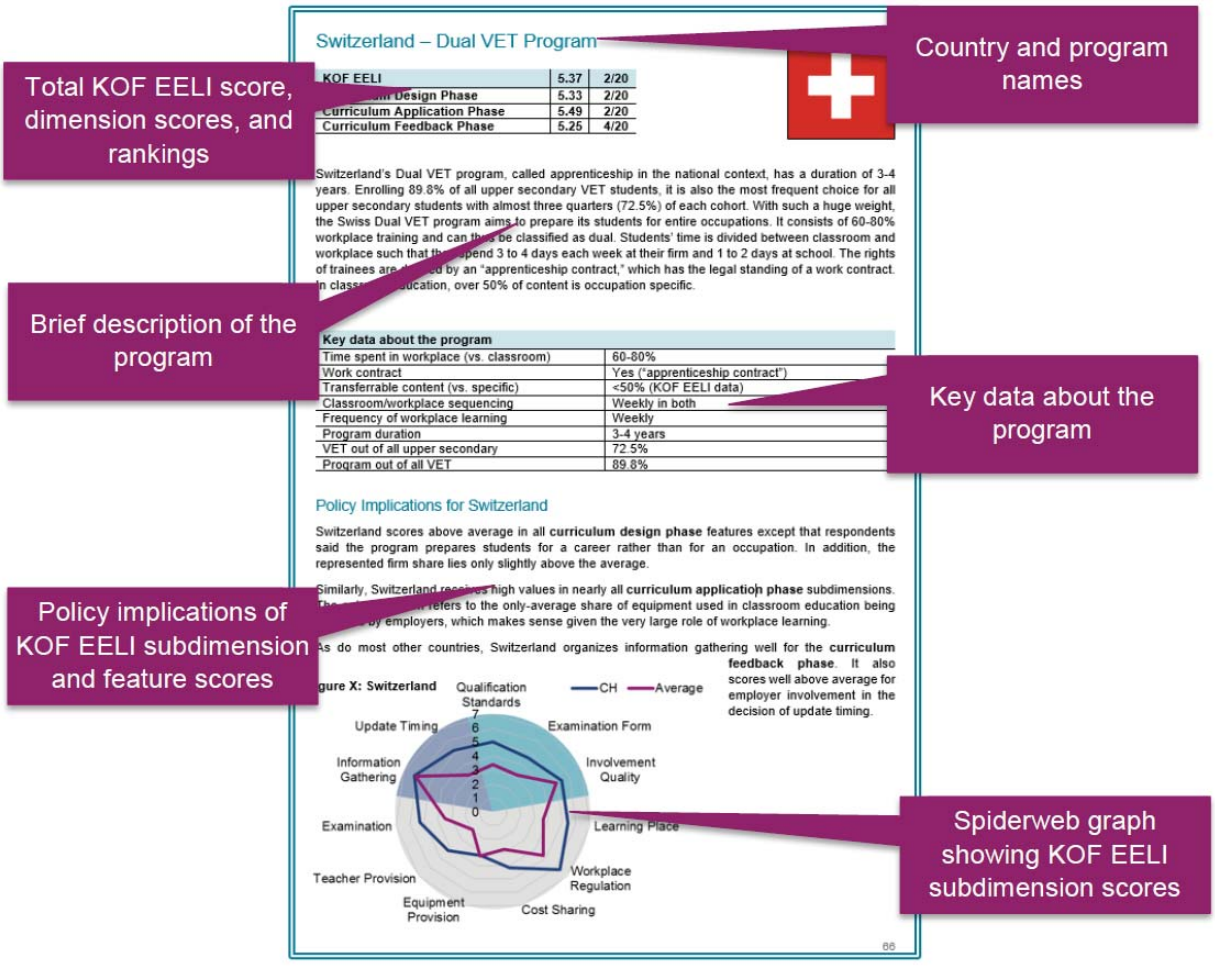
**These features are combinations of smaller, related features. See Renold et al., 2016 for more.*

***These features have 0% weight in the total index because of low variation, collinearity with another feature, or irrelevance.*

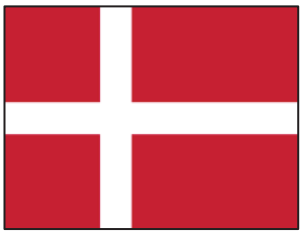
Appendix 2: Country Factsheets

The one-page factsheets in this section summarize the main upper-secondary VET program in each of the 20 countries studied. We show each country's total KOF EELI score along with its scores for the three Curriculum Value Chain phases, summarize the program's key characteristics, and show key data about the program in a table. Finally, we give a short analysis of policy implications from the KOF EELI for each country and show the spiderweb comparing the country's process-level scores to the average. Figure A1 shows how to read the factsheets.

Figure A1: Factsheet example



Denmark – EUD Program



	Score	Rank
KOF EELI	**4.92**	**3/20**
Curriculum Design Phase	**5.02**	**4/20**
Curriculum Application Phase	**4.59**	**4/20**
Curriculum Feedback Phase	**5.08**	**6/20**

The Danish EUD (*erhvervsuddannelserne*) program typically has a duration of 4-4.5 years. With an enrollment rate of 99.4% of all upper secondary VET students, it is by far the main VET pathway. VET is strong overall in the Danish education system, absorbing 45% of all upper secondary students (in 2015). During the main course, which starts after one introductory year of full-time classroom education, students alternate between the classroom and the workplace, spending 50-70% of their time in workplace training. Most students are in firms at least semiannually. Therefore, this program meets the requirements to be classified as a dual VET program. EUD students' rights are defined by a training contract. In classroom education, over 50% of content is occupation-specific.

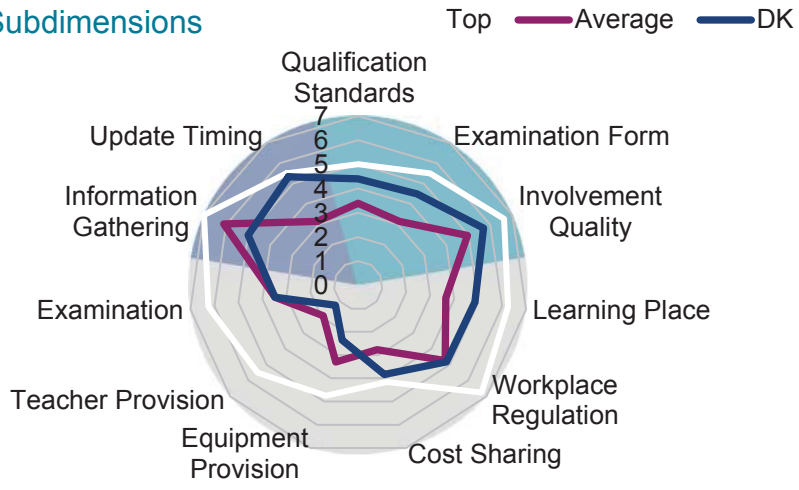
Key data about the program	
Time spent in workplace (vs. classroom)	50-70% (main course) (DMCEGE, 2015a, c)
Work contract	yes ("training contract") (DMCEGE, 2016)
Transferrable content (vs. specific)	<50% (KOF EELI data)
Classroom/workplace sequencing	Classroom, then alternating (DMCEGE, 2015c)
Frequency of workplace learning	At least semiannually (KOF EELI data)
Program duration	4-4.5 years (DMCEGE, 2015a)
VET out of all upper secondary	45% (Statistics Denmark, 2016)
Program out of all VET	99.4% = 44.6% of all upper secondary
Number of curricula/qualifications	111 with 301 steps and concentrations (DMCEGE, 2014a)

Policy Implications for Denmark

Denmark scores above average in all **curriculum design phase** subdimensions. The one feature that raises concern is about how employers are involved, as Denmark focuses on employer associations but leaves relatively little room for the involvement of individual firms.

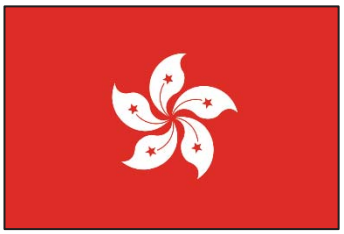
Both the learning place and cost sharing subdimensions are strengths of the Danish VET system. Denmark is average for examination and workplace regulation. Denmark's weaknesses in the **curriculum application phase** are its low share of equipment and teachers in classroom education provided by employers.

Subdimensions



Information-gathering can be improved further in the **curriculum feedback phase**. The involvement of employers in the decision to update curricula is a strength of the Danish education system.

Hong Kong – DVE Program



	Score	Rank
KOF EELI	**3.00**	**15/20**
Curriculum Design Phase	**2.96**	**15/20**
Curriculum Application Phase	**3.22**	**10/20**
Curriculum Feedback Phase	**3.01**	**13/20**

The DVE (Diploma of Vocational Education) program in Hong Kong has a duration of 3-4 years. Only 7% of students at the upper-secondary level follow the VET pathway, and most of those students pursue DVE programs. Traditional DVE consists of less than 50% workplace training according to the data collected in the KOF EELI survey. The workplace training part of the DVE program normally takes place after completion of classroom education. Thus, this program cannot be classified as dual, although the information obtained through the questionnaire is not absolutely conclusive. Again according to KOF EELI responses, DVE students' rights are defined by a work contract. It is not clear if this refers to part-time students, full-time, or both. In classroom education, about 50% of content is occupation-specific.

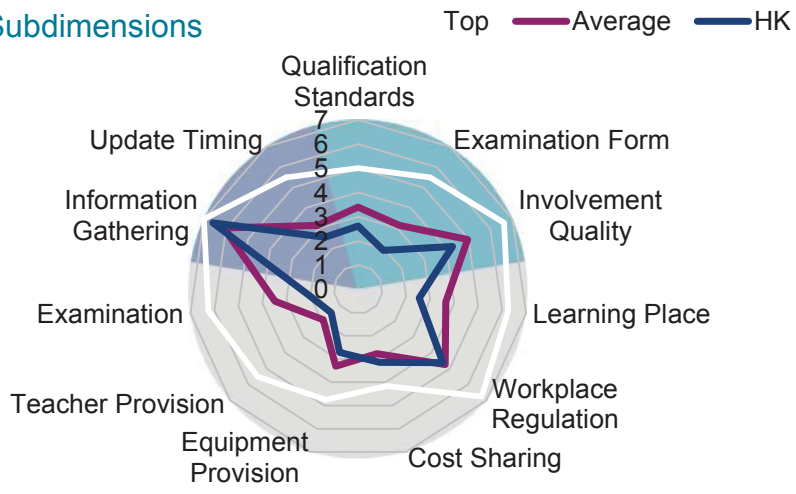
Key data about the program	
Time spent in workplace (vs. classroom)	<50% (KOF EELI data)
Work contract	Yes (KOF EELI data)
Transferrable content (vs. specific)	<=50% (KOF EELI data)
Classroom/workplace sequencing	Alternating (KOF EELI data)
Frequency of workplace learning	After classroom ed. (KOF EELI data)
Program duration	3-4 years (GovHK, 2015a)
VET out of all upper secondary	7% (approx.) (HKStat, 2016)
Program out of all VET	71.4% = 5% of all upper secondary (approx.)
Number of curricula/qualifications	16 (VTC, 2016)

Policy Implications for Hong Kong

Hong Kong scores well below average in all subdimensions of the **curriculum design phase**.

Hong Kong should improve the learning place dimension, both by increasing the share of workplace training and improving the legal definition of the learning place. Hong Kong scores close to the average for the other **curriculum application phase** dimensions of workplace training regulation, cost sharing, and equipment and teacher provision. However, Hong Kong receives low values on all features in the examination subdimension.

Subdimensions



Hong Kong does gather the information necessary for the **curriculum feedback phase,** but scores slightly below average on whether employer involvement in deciding when to update is *de facto* or *de jure*.

The Netherlands – MBO BOL Program

	Score	Rank
KOF EELI	**3.68**	**12/20**
Curriculum Design Phase	**3.79**	**10/20**
Curriculum Application Phase	**3.20**	**11/20**
Curriculum Feedback Phase	**3.70**	**8/20**

The Dutch MBO BOL (*Middelbaar Beroepsonderwijs - Beroeps Opleidende Leerweg)* program lasts 2-4 years, more often 4. More Dutch students choose an upper secondary VET pathway (67%) than a general pathway. Within upper secondary VET, the MBO BOL program has 79% of students with the other 21% in the MBO BBL program. A typical MBO BOL program is 20% workplace learning, although this can vary dramatically up to 60%. Students' time is divided between classroom and workplace in an alternating manner, such that they are in firms at least annually. Although MBO BOL is mainly a school-based program, there is some workplace training. MBO BOL students do not have contracts with an employer, though MBO BBL students do. According to our experts, over 50% of content in classroom education is occupation specific.

Key data about the program	
Time spent in workplace (vs. classroom)	20-60% (CEDEFOP, 2014b)
Work contract	No (Yes in BBL)
Transferrable content (vs. specific)	<50% (KOF EELI data)
Classroom/workplace sequencing	Alternating (KOF EELI data)
Frequency of workplace learning	At least annually (KOF EELI data)
Program duration	2-4 years (CEDEFOP, 2014a)
VET out of all upper secondary	67%* (Eurostat, 2016)
Program out of all VET	100% = 67% of all upper secondary
Number of curricula/qualifications	176 with 489 profiles (CEDEFOP, 2016)

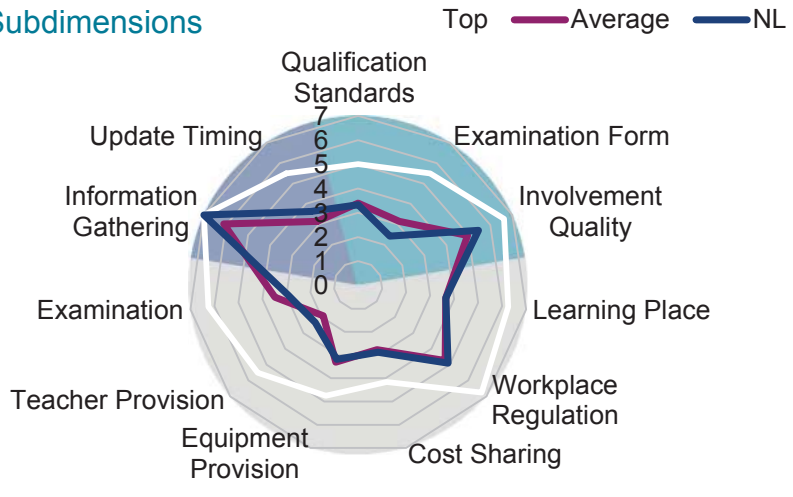
* This number is different from those in Table 4.5, since Table 4.5 refers to the enrolment at the total secondary level, i.e. lower *and* upper secondary level.

Policy Implications for the Netherlands

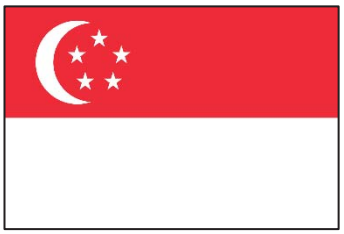
In the **curriculum design phase**, the Netherlands earns an average score in the qualification standards definition, but the examination form is a weakness of the Netherlands. Involvement quality is above average, particularly because employers participate through both employer associations and individual firms under a clear legal definition of employer involvement.

The Netherlands scores about average on all subdimensions of the **curriculum application phase**. The Netherlands has a small advantage on teacher provision. Conversely, the small disadvantage on the examination arises because the share of employer-provided experts is low while external supervision of practical examinations is high. Further note that the average learning place subdimension value masks a weakness in terms of time spent in workplace training and a strength in terms of the legal definition of that time division.

Subdimensions



Singapore – Institutes of Technical Education



	Score	Rank
KOF EELI	**2.94**	**16/20**
Curriculum Design Phase	**2.79**	**16/20**
Curriculum Application Phase	**2.99**	**14/20**
Curriculum Feedback Phase	**3.45**	**10/20**

Singapore's Institute of Technical Education (ITE) programs have a duration of 2 years. Approximately 25% of students choose a VET pathway at the level of the ITEs, though Singapore's education system and lack of VET at the upper-secondary level means we do not focus on that level here. ITEs aim to prepare students for entry into the labor market. They mainly consist of classroom education, with workplace training making up far less than 50% of students' time. When students are in firms, it is only after classroom education is over and they might return to alternate periods of work and schooling. Students in work have contracts, according to responses to the KOF EELI survey. The vast majority of the ITE program is not dual VET. In classroom education, over 50% of content is occupation-specific.

Key data about the program	
Time spent in workplace (vs. classroom)	<50% (ITE, 2012 & 2016)
Work contract	Yes (KOF EELI data)
Transferrable content (vs. specific)	<50% (KOF EELI data)
Classroom/workplace sequencing	Alternating (KOF EELI data)
Frequency of workplace learning	After completing classroom ed. (KOF EELI data)
Program duration	2 years (APEC, 2010)
VET out of all upper secondary	65% (APEC, 2010)
Program out of all VET	38.5% = 25% of all **post**-secondary
Number of curricula/qualifications	97 (Nitecs and Higher Nitecs) (ITE, 2015)

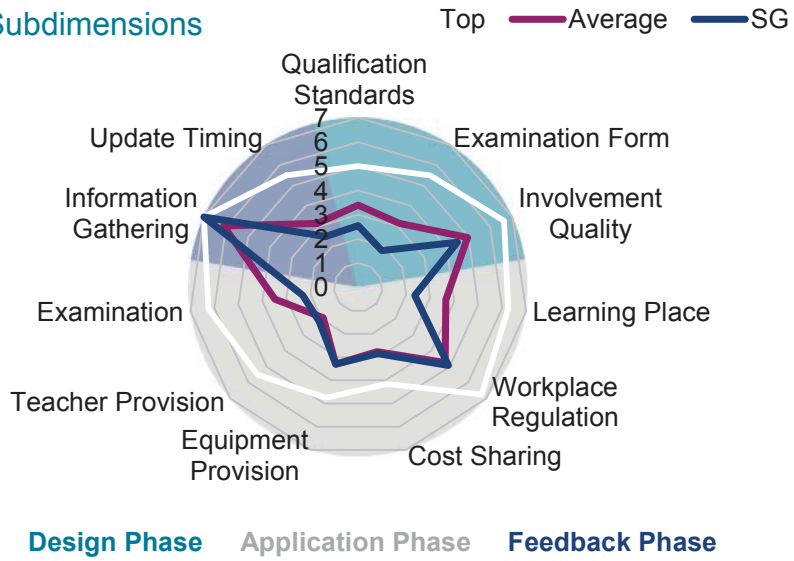
Policy Implications for Singapore

Singapore's scores are below average for employer participation in the **curriculum design phase**. The quality of involvement, however, scores only slightly below average because the focus on whole occupations and the involvement of employers as both individual firms and employer associations make up for the small share of represented firms and the severe lack of a legal definition of involvement.

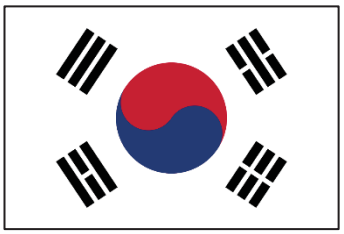
Singapore can improve linkage substantially by increasing the share of workplace training and the legal definition thereof. While Singapore's scores are average for workplace regulation, cost sharing, equipment provision, and teacher provision in the **curriculum application phase**, the practical share of examinations remains low, seldom takes place in the workplace, and is not often supervised by employer-provided experts.

While Singapore gathers information well in the **curriculum feedback phase**, it scores below average in terms of involving employers in the decision to update the curriculum.

Subdimensions



South Korea – VET High Schools



	Score	Rank
KOF EELI	**2.87**	**17/20**
Curriculum Design Phase	**3.53**	**13/20**
Curriculum Application Phase	**2.59**	**16/20**
Curriculum Feedback Phase	**2.08**	**16/20**

Courses of study at South Korea's VET High Schools last 3 years. While only a minority (17.6%) of each cohort chooses a VET pathway at the upper secondary level, VET High Schools are the most popular option within the VET sector with 95.5% of all upper secondary VET students. Learning takes place mainly in the classroom, with the share of workplace training far below 50%. When workplace training exists, it takes place at least semiannually. While VET High School students do not have work contracts when they train at work, those at Meister High Schools do have such contracts. In VET High School classroom education, 50% of the content is occupation-specific.

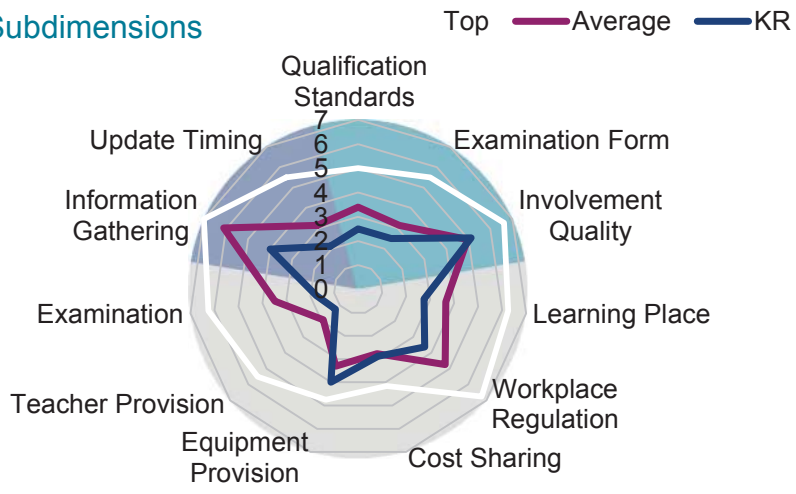
Key data about the program	
Time spent in workplace (vs. classroom)	<50% (Heo, 2014)
Work contract	Experts disagree (KOF EELI data)
Transferrable content (vs. specific)	50% (KOF EELI data)
Classroom/workplace sequencing	Experts disagree (KOF EELI data)
Frequency of workplace learning	Experts disagree (KOF EELI data)
Program duration	3 years (IQAS, 2009)
VET out of all upper secondary	17.6% (Choi, 2014)
Program out of all VET	95.5% = 16.8% of all upper secondary
Number of curricula/qualifications	5 sectors (Choi, 2014)

Policy Implications for South Korea

The involvement quality subdimension of the **curriculum design phase** scores above average even though students prepare for a career rather than an occupation. South Korea should increase the involvement and decision power of employers for qualification standards and the examination form.

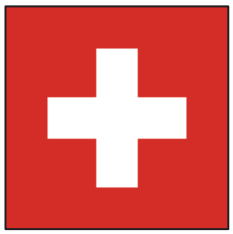
South Korea also struggles in the **curriculum application phase,** especially in terms of the share of workplace training and its corresponding legal definition. Ameliorating this would require an improvement in all features of workplace training regulation. The strengths of the Korean system are its average cost sharing subdimension and high provision of classroom equipment by firms. However, South Korea scores below average on employers' teacher provision and examination.

Subdimensions



The **curriculum feedback phase** scores for both information gathering and update timing subdimension are well below average.

Switzerland – Apprenticeship (Dual VET)



	Score	Rank
KOF EELI	**5.37**	**2/20**
Curriculum Design Phase	**5.33**	**2/20**
Curriculum Application Phase	**5.49**	**2/20**
Curriculum Feedback Phase	**5.25**	**4/20**

Switzerland's Dual VET program, called apprenticeship in the national context, has a duration of 2 or 3-4 years for the certificate or full apprenticeship, respectively. Enrolling 89.8% of all upper secondary VET students, it is also the most frequent choice for all upper secondary students with almost three quarters (72.5%) of each cohort. It consists of 60-80% workplace training and can thus be classified as dual. Students' time is divided between classroom and workplace such that they spend 3 to 4 days each week at their firm and 1 to 2 days at school. The rights of trainees are defined by an "apprenticeship contract," which has the legal standing of a work contract. In classroom education, over 50% of content is occupation specific.

Key data about the program	
Time spent in workplace (vs. classroom)	60-80% (SERI, 2015)
Work contract	Yes ("apprenticeship contract") (SERI, 2015)
Transferrable content (vs. specific)	>50% (KOF EELI data)
Classroom/workplace sequencing	Weekly in both (SERI, 2015)
Frequency of workplace learning	Weekly (SERI, 2015)
Program duration	3-4 years (SERI, 2015)
VET out of all upper secondary	72.5% (SERI, 2015)
Program out of all VET	89.8% = 65.1% of all upper secondary
Number of curricula/qualifications	230 occupations (SERI, 2015)

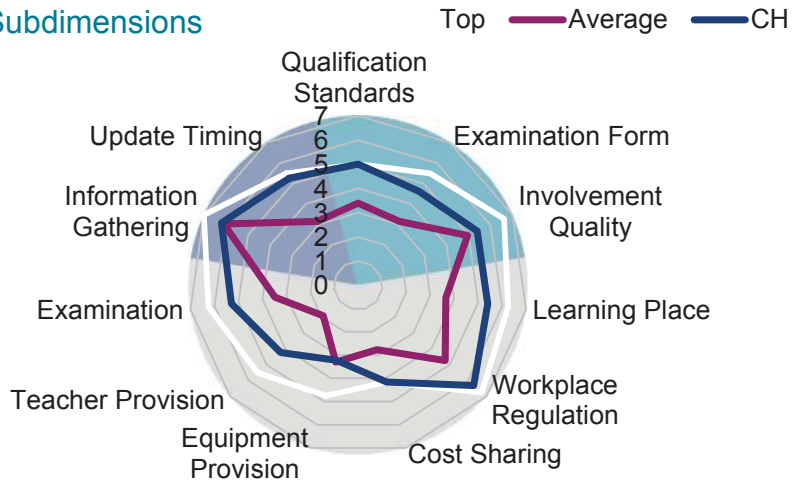
Policy Implications for Switzerland

Switzerland scores above average in all **curriculum design phase** features. In addition, the represented firm share lies only slightly above the average.

Similarly, Switzerland receives high values in nearly all **curriculum application phase** subdimensions. The exception is Switzerland's the average score for classroom equipment provision by employers. However, that is to be expected in the context of a workplace training system.

As do most other countries, Switzerland organizes information gathering well for the **curriculum feedback phase**. It also scores well above average for employer involvement in the decision of update timing.

Subdimensions



Design Phase Application Phase **Feedback Phase**

4.5 Non-focus country results

Austria – Apprenticeship (Dual System)

	Score	Rank
KOF EELI	**5.39**	**1/20**
Curriculum Design Phase	**5.28**	**3/20**
Curriculum Application Phase	**5.56**	**1/20**
Curriculum Feedback Phase	**5.15**	**5/20**

Austria's Apprenticeship program—called the dual system in the national context—has a duration of 2-4 years, with the 3 year version the most frequent. Enrolling 50.4% of all upper secondary VET students, it is the main VET program in an education system where VET plays a very important role with as much as 80% of every cohort. This program consists of over 50% of workplace training, so it can be classified as dual. Student's time is organized in a way that they are in both the workplace and the school every week, and their rights are defined by a work contract. In the Austrian Apprenticeship program's classroom education, less than 50% is general, so over 50% is occupation-specific.

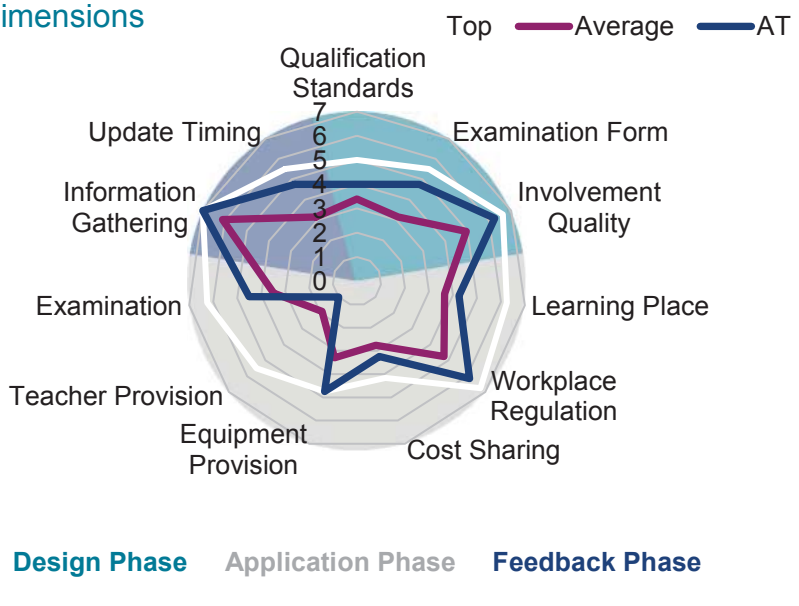
Key data about the program	
Time spent in workplace (vs. classroom)	>50%
Work contract	Yes
Transferrable content (vs. specific)	<50%
Classroom/workplace sequencing	Weekly in both
Frequency of workplace learning	Weekly
Program duration	2-4 years (CEDEFOP, 2012a)
VET out of all upper secondary	80% (CEDEFOP, 2012a)
Program out of all VET	50.4% = 40% of all upper secondary
Number of curricula/qualifications	206 occupations (CEDEFOP, 2012a)

Note: Data in the first five rows comes from the KOF EELI responses.

Policy Implications for Austria

We cannot reasonably derive policy implications from the very small number of expert responses in the non-focus countries or without doing a case study of each country's VET. Therefore, we present the spiderweb of subdimension scores as a first look at what the KOF EELI can show, and we look forward to implementing it with more experts in the future.

Subdimensions



Canada – VET at Secondary Schools

	Score	Rank*
KOF EELI	**0.00**	**19/20***
Curriculum Design Phase	**0.00**	**19/20***
Curriculum Application Phase	**0.00**	**19/20***
Curriculum Feedback Phase	**0.00**	**19/20***

*Lithuania and Canada tie because both have no scores.

The VET programs offered at Canadian Secondary Schools are probably the most diverse program we consider as a single program. Canada is a strongly federalized country where educational authority is located at the province or territory level and not at the federal level. In addition, Canadian provinces and territories often do not officially differentiate between VET programs and general education programs at the upper secondary education level. Programs with a VET character can be taught either in secondary schools offering both VET and general education or in dedicated VET centers. There are many local or unique programs that last 4-6 years and lead to very different kinds of diplomas, and with no other form of VET at the upper secondary level they represent 100% of all VET students. Owing to this diversity, it was also impossible to find any experts who felt able to respond the EELI survey without unmanageable effort. Due to this fundamental feasibility issue, we cannot present any KOF EELI results.

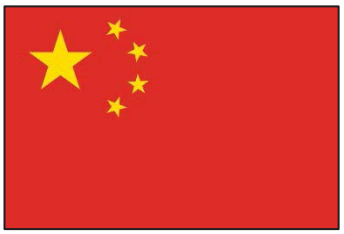
Key data about the program	
Time spent in workplace (vs. classroom)	-
Work contract	-
Transferrable content (vs. specific)	-
Classroom/workplace sequencing	-
Frequency of workplace learning	-
Program duration	4-6 years (CMEC, 2008)
VET out of all upper secondary	Unknown
Program out of all VET	100% (CMEC, 2008)
Number of curricula/qualifications	Unknown

Note: Data in the first five rows comes from the KOF EELI responses.

Policy Implications for Canada

No expert was able to respond for the Canadian system, even at individual province levels. Canadian KOF EELI scores may only be feasible by surveying experts at the local or even school levels.

China (Shanghai) – Vocational Schools



	Score	Rank
KOF EELI	**3.14**	**14/20**
Curriculum Design Phase	**3.95**	**8/20**
Curriculum Application Phase	**3.34**	**8/20**
Curriculum Feedback Phase	**1.30**	**18/20**

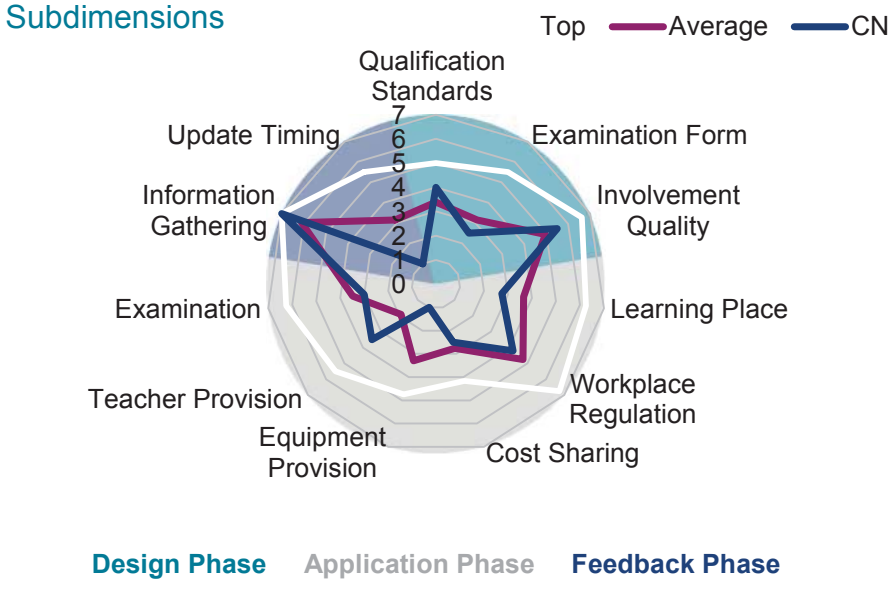
The Chinese (Shanghai) Vocational Schools program has a duration of 3-4 years, with the 3-year version the most frequent one. As these schools represent the only existing VET pathway at the upper secondary education level, they have 100% of VET enrollment. The VET sector absorbs 43% of each cohort, with general programs taking the rest. The Vocational Schools curricula consist of less than 50% of workplace training. Workplace training takes place at least semiannually, and student's rights are defined by a work contract. Classroom education at Chinese Vocational Schools is 50% general and 50% occupation specific.

Key data about the program	
Time spent in workplace (vs. classroom)	<50%
Work contract	Yes
Transferrable content (vs. specific)	50%
Classroom/workplace sequencing	Alternating
Frequency of workplace learning	At least semiannually
Program duration	3-4 years (OECD, 2010)
VET out of all upper secondary	43% (OECD, 2010)
Program out of all VET	100% = 43% of all upper secondary
Number of curricula/qualifications	270 in 13 branches (OECD, 2010)

Note: Data in the first five rows comes from the KOF EELI responses.

Policy Implications for China

We cannot reasonably derive policy implications from the very small number of expert responses in the non-focus countries or without doing a case study of each country's VET. Therefore, we present the spiderweb of subdimension scores as a first look at what the KOF EELI can show, and we look forward to implementing it with more experts in the future.



Estonia – School-based VET

	Score	Rank
KOF EELI	**3.95**	**8/20**
Curriculum Design Phase	**3.58**	**12/20**
Curriculum Application Phase	**3.16**	**12/20**
Curriculum Feedback Phase	**5.72**	**3/20**

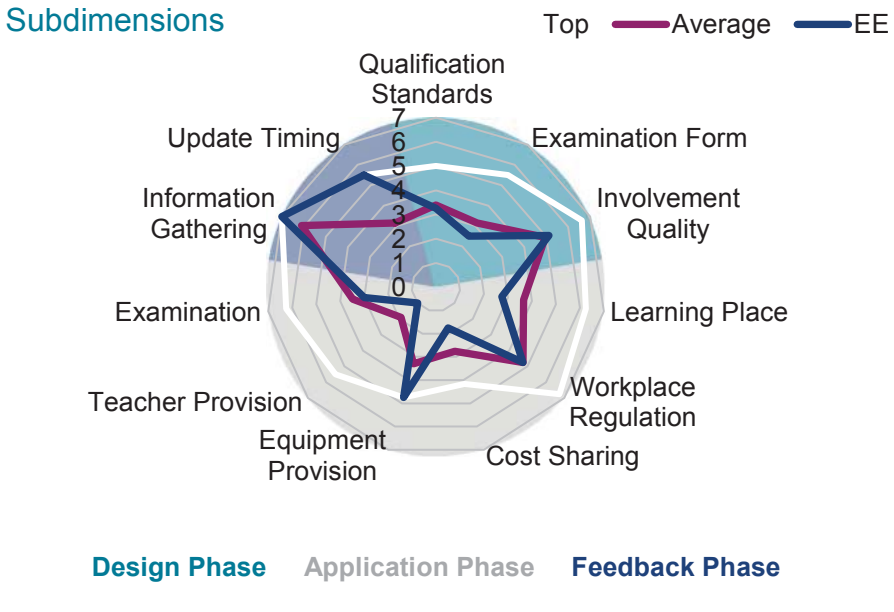
The Estonian School-based VET Program, which gives access to higher education, has a duration of at least 3 years. With an enrolment rate of 90.6% of all upper secondary VET students, it is by far the main VET pathway, though VET does not play a very important role at the upper secondary level with only 28% of each cohort. The share of workplace training is less than 50%, which is unsurprising in a school-based program. Also unsurprisingly, students do not have work contracts and over 50% of content in classroom education is general and not occupation-specific. Students are in firms at least annually despite the school-based nature of the program, and alternate small periods of work with large periods of schooling.

Key data about the program	
Time spent in workplace (vs. classroom)	<50%
Work contract	No
Transferrable content (vs. specific)	>50%
Classroom/workplace sequencing	Alternation
Frequency of workplace learning	At least annually
Program duration	3 years (CEDEFOP, 2014b)
VET out of all upper secondary	28% (CEDEFOP, 2014b)
Program out of all VET	90.6% = 25.4% of all upper secondary
Number of curricula/qualifications	657 (Kerem, 2012)

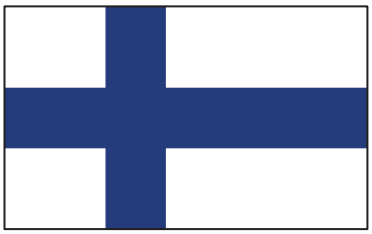
Note: Data in the first five rows comes from the KOF EELI responses.

Policy Implications for Estonia

We cannot reasonably derive policy implications from the very small number of expert responses in the non-focus countries or without doing a case study of each country's VET. Therefore, we present the spiderweb of subdimension scores as a first look at what the KOF EELI can show, and we look forward to implementing it with more experts in the future.



Finland – School-based VET



	Score	Rank
KOF EELI	**3.84**	**10/20**
Curriculum Design Phase	**3.90**	**9/20**
Curriculum Application Phase	**3.79**	**6/20**
Curriculum Feedback Phase	**3.41**	**11/20**

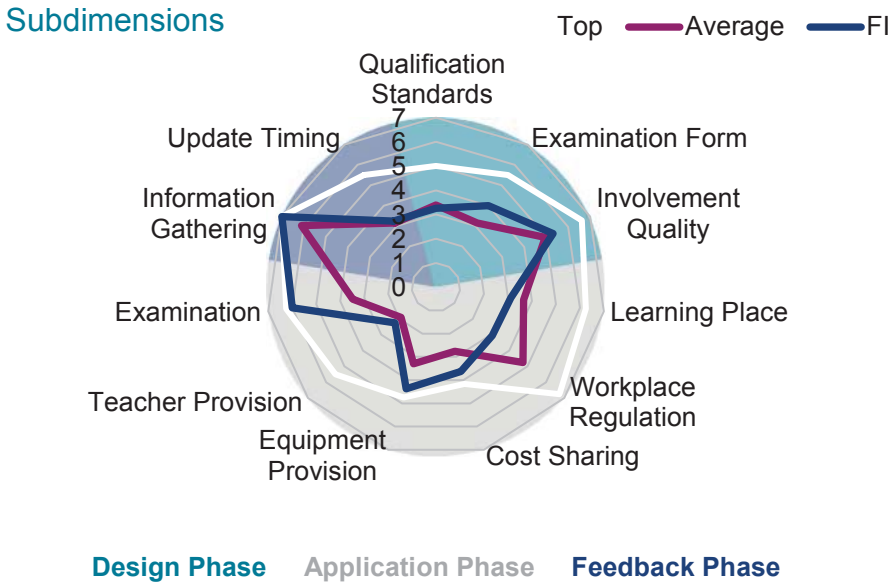
Finland's school-based VET program lasts 3 years. With an enrollment rate of 69.4% out of all upper secondary VET students, it is the main VET program. VET as a whole absorbs approximately 40% of a given cohort. The program's curriculum calls for students to spend up to 50% of their time in workplace training and up to 50% of material is general instead of occupation-specific. These characteristics may differ among occupations, as the two experts who responded the EELI survey gave different information. The experts also disagree on whether trainees have work contracts. Students alternate between the two learning places in such a way that they are in firms at least annually.

Key data about the program	
Time spent in workplace (vs. classroom)	Experts disagree
Work contract	Experts disagree
Transferrable content (vs. specific)	Experts disagree
Classroom/workplace sequencing	Alternation
Frequency of workplace learning	At least annually
Program duration	3 years (CEDEFOP, 2014c)
VET out of all upper secondary	Approx. 40% (CEDEFOP, 2014c)
Program out of all VET	69.4% = 27.8% of all upper secondary
Number of curricula/qualifications	8 main fields of study (CEDEFOP, 2014c)

Note: Data in the first five rows comes from the KOF EELI responses.

Policy Implications for Finland

We cannot reasonably derive policy implications from the very small number of expert responses in the non-focus countries or without doing a case study of each country's VET. Therefore, we present the spiderweb of subdimension scores as a first look at what the KOF EELI can show, and we look forward to implementing it with more experts in the future.



Germany – Apprenticeship (Dual System)

	Score	Rank
KOF EELI	**4.77**	**4/20**
Curriculum Design Phase	**4.37**	**6/20**
Curriculum Application Phase	**4.80**	**3/20**
Curriculum Feedback Phase	**4.21**	**7/20**

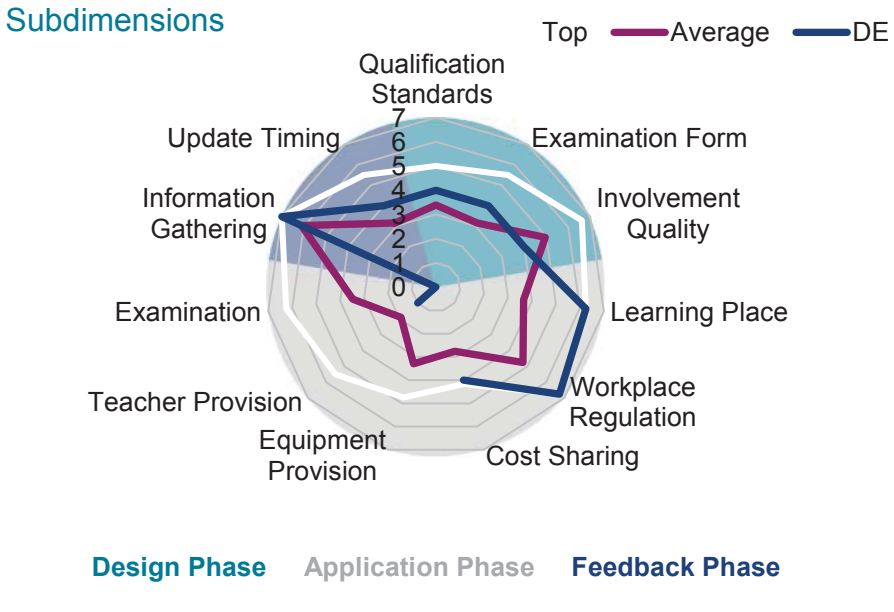
Germany's Apprenticeship program—called the Dual System in the national context—typically has a duration of 3 years. It enrolls 63.4% of upper secondary VET students, and VET as a whole accounts for 51.5% of each cohort. The program consists of over 50% workplace training and thus is clearly a dual program. Students' rights are defined by a work contract and in classroom education, 50% of content is occupation specific. KOF EELI responses unfortunately contain no information on the exact division of students' time between classroom and workplace.

Key data about the program	
Time spent in workplace (vs. classroom)	>50%
Work contract	Yes
Transferrable content (vs. specific)	50%
Classroom/workplace sequencing	-
Frequency of workplace learning	-
Program duration	3 years (CEDEFOP, 2012b)
VET out of all upper secondary	51.5% (CEDEFOP, 2012b)
Program out of all VET	63.4% = 32.7% of all upper secondary
Number of curricula/qualifications	328 (BIBB, 2015)

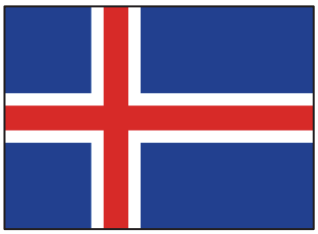
Note: Data in the first five rows comes from the KOF EELI responses.

Policy Implications for Germany

We cannot reasonably derive policy implications from the very small number of expert responses in the non-focus countries or without doing a case study of each country's VET. Therefore, we present the spiderweb of subdimension scores as a first look at what the KOF EELI can show, and we look forward to implementing it with more experts in the future.



Iceland – Apprenticeship Program



	Score	Rank
KOF EELI	**4.09**	**6/20**
Curriculum Design Phase	**4.72**	**5/20**
Curriculum Application Phase	**3.02**	**13/20**
Curriculum Feedback Phase	**3.37**	**12/20**

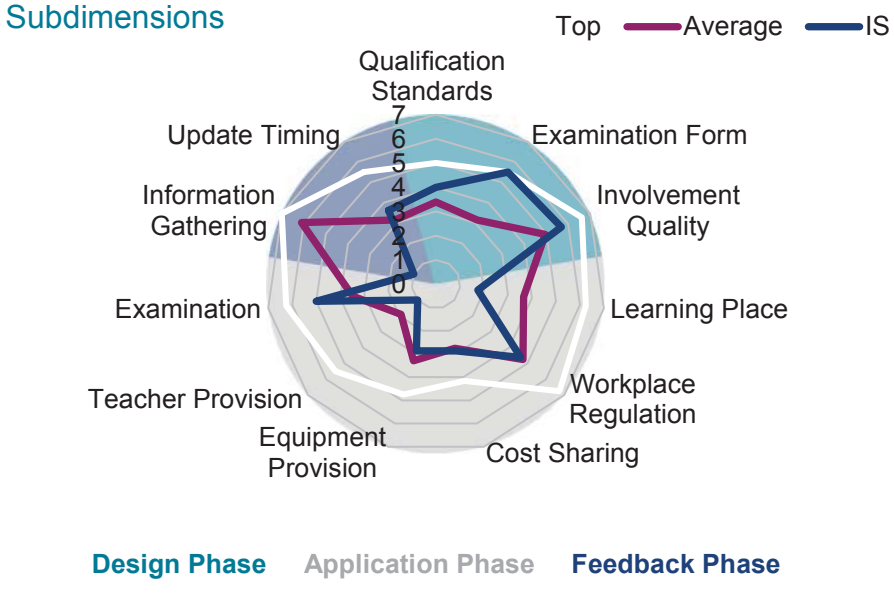
Iceland's Apprenticeship Program has a duration of 1-4 years. While about a third of each cohort chooses a VET pathway at the upper secondary education level (32.7%), the vast majority (89.6%) of those students are enrolled in the Apprenticeship program. This program consists of less than 50% of workplace training, but students' rights are defined by a work contract. Up to 50% of the content of classroom education is general. This may differ among occupations, as the two experts who responded the EELI survey gave different information. The same applies to the exact division of students' time between classroom education and workplace training, as one expert states that students are in firms at least semiannually while the other says workplace training takes place after the completion of classroom education.

Key data about the program	
Time spent in workplace (vs. classroom)	<50%
Work contract	Yes
Transferrable content (vs. specific)	Experts disagree
Classroom/workplace sequencing	Alternation
Frequency of workplace learning	Experts disagree
Program duration	1-4 years (CEDEFOP, 2014d)
VET out of all upper secondary	32.7% (CEDEFOP, 2014d)
Program out of all VET	89.6% = 29.3% of all upper secondary
Number of curricula/qualifications	12 fields of study (OECD, 2013)

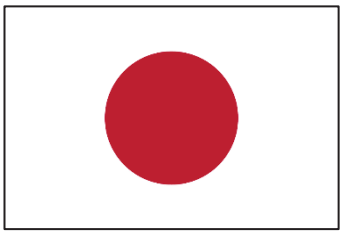
Note: Data in the first five rows comes from the KOF EELI responses.

Policy Implications for Iceland

We cannot reasonably derive policy implications from the very small number of expert responses in the non-focus countries or without doing a case study of each country's VET. Therefore, we present the spiderweb of subdimension scores as a first look at what the KOF EELI can show, and we look forward to implementing it with more experts in the future.



Japan – Specialized (Vocational) High Schools



	Score	Rank
KOF EELI	**1.69**	**18/20**
Curriculum Design Phase	**1.33**	**17/20**
Curriculum Application Phase	**1.85**	**17/20**
Curriculum Feedback Phase	**1.12**	**18/20**

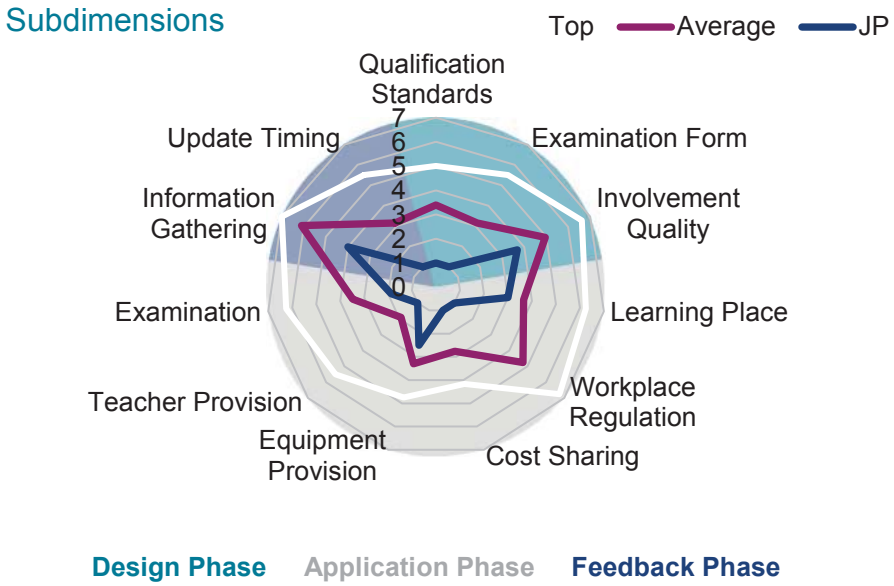
The programs at Japan's Specialized High Schools last 3 years. With an enrolment rate of 78.2% of all upper secondary VET students, these schools clearly represent the main VET pathway at this level in Japan. VET as a whole, however, is not very important in the Japanese context with only 24.2% of any cohort. The amount of workplace training seems to vary widely, as one of the two experts who responded to KOF EELI said students spend 0% of their time in the workplace and the other 50%. Students have no work contracts with firms, and classroom education is over 50% general. Experts diverge again on the division of student's time between workplace and classroom, saying both that students never have workplace training in firms and that they are in firms weekly.

Key data about the program	
Time spent in workplace (vs. classroom)	Experts disagree
Work contract	No
Transferrable content (vs. specific)	>50%
Classroom/workplace sequencing	Experts disagree
Frequency of workplace learning	Experts disagree
Program duration	3 years (Ichimi, 2012)
VET out of all upper secondary	24.2% (MEXT, 2016)
Program out of all VET	78.2% = 18.9% of all upper secondary
Number of curricula/qualifications	8 school types (fields of study) (MEXT, 2016)

Note: Data in the first five rows comes from the KOF EELI responses.

Policy Implications for Japan

We cannot reasonably derive policy implications from the very small number of expert responses in the non-focus countries or without doing a case study of each country's VET. Therefore, we present the spiderweb of subdimension scores as a first look at what the KOF EELI can show, and we look forward to implementing it with more experts in the future.



Lithuania – School-based VET

	Score	Rank*
KOF EELI	**0.00**	**19/20***
Curriculum Design Phase	**0.00**	**19/20***
Curriculum Application Phase	**0.00**	**19/20***
Curriculum Feedback Phase	**0.00**	**19/20***

*Lithuania and Canada tie because both have no scores.

Lithuania's School-based VET Program lasts 3 years. It is the main program within the upper secondary VET sector, though we can find no exact enrolment rate of the program in VET as a whole. Compared to upper secondary general education, 26.8% of each cohort pursues VET. It was not possible to find any experts who were able and willing to respond the KOF EELI questionnaire. Due to this essential feasibility issue, there are no EELI data to be presented here.

Key data about the program	
Time spent in workplace (vs. classroom)	-
Work contract	-
Transferrable content (vs. specific)	-
Classroom/workplace sequencing	-
Frequency of workplace learning	-
Program duration	3 years (CEDEFOP, 2014e)
VET out of all upper secondary	26.8% (CEDEFOP, 2014e)
Program out of all VET	Main (CEDEFOP, 2014e)
Number of curricula/qualifications	10 sectoral qualifications (CEDEFOP, 2014e)

Note: Data in the first five rows comes from the KOF EELI responses.

Policy Implications for Lithuania

We were not able to identify an expert who felt qualified to respond to the KOF EELI questionnaire. This might be because there is a language barrier, because VET is not widely studied in Lithuania, or due to cultural issues. KOF EELI scores for Lithuania might require personally visiting the country.

Luxembourg – Technical Secondary School Leaving Diploma

	Score	Rank
KOF EELI	**3.74**	**11/20**
Curriculum Design Phase	**0.00**	**18/20**
Curriculum Application Phase	**1.45**	**18/20**
Curriculum Feedback Phase	**7.00**	**1/20**

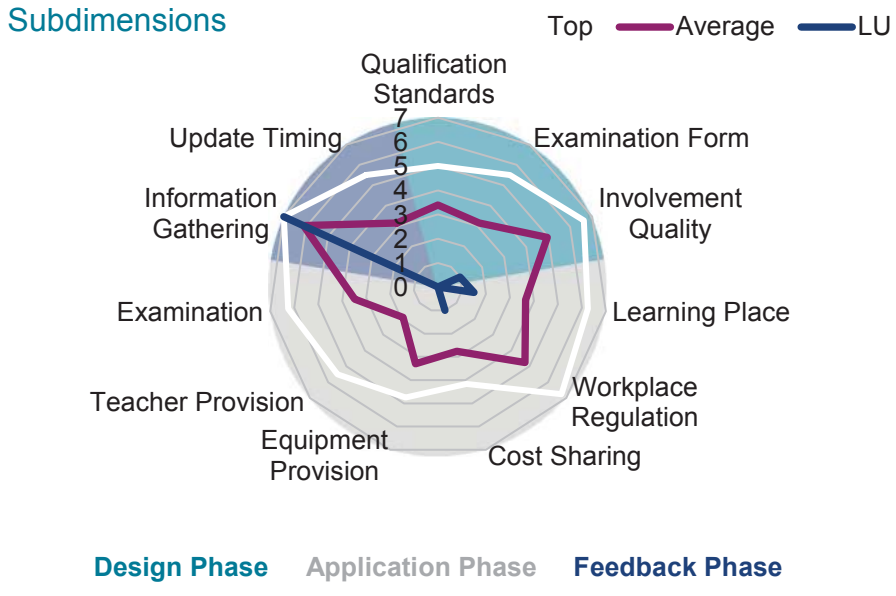
Luxembourg's upper secondary program leading to the Technical Secondary School Leaving Diploma, which gives access to higher education, has a duration of 4-5 years. It is the most frequently chosen program at the upper secondary VET level and enrolls 45.6% out of all VET students, who make up 68% of the upper secondary level as a whole. This program can be characterized as more of a technical than a VET program in a narrow sense, as it does not include any kind of workplace training. Consequently, the program's students do not have work contracts with any employers. Also, over 50% of content in classroom education—which comprises the entire curriculum—is general.

Key data about the program	
Time spent in workplace (vs. classroom)	0%
Work contract	No
Transferrable content (vs. specific)	>50%
Classroom/workplace sequencing	-
Frequency of workplace learning	-
Program duration	4-5 years (CEDEFOP, 2015)
VET out of all upper secondary	68% (CEDEFOP, 2015)
Program out of all VET	45.6% = 31% of all upper secondary
Number of curricula/qualifications	7 (CEDEFOP, 2012d)

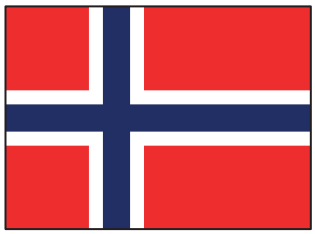
Note: Data in the first five rows comes from the KOF EELI responses.

Policy Implications for Luxembourg

We cannot reasonably derive policy implications from the very small number of expert responses in the non-focus countries or without doing a case study of each country's VET. Therefore, we present the spiderweb of subdimension scores as a first look at what the KOF EELI can show, and we look forward to implementing it with more experts in the future.



Norway – Apprenticeship (2+2 System)



	Score	Rank
KOF EELI	**3.91**	**9/20**
Curriculum Design Phase	**4.00**	**7/20**
Curriculum Application Phase	**4.40**	**5/20**
Curriculum Feedback Phase	**2.73**	**14/20**

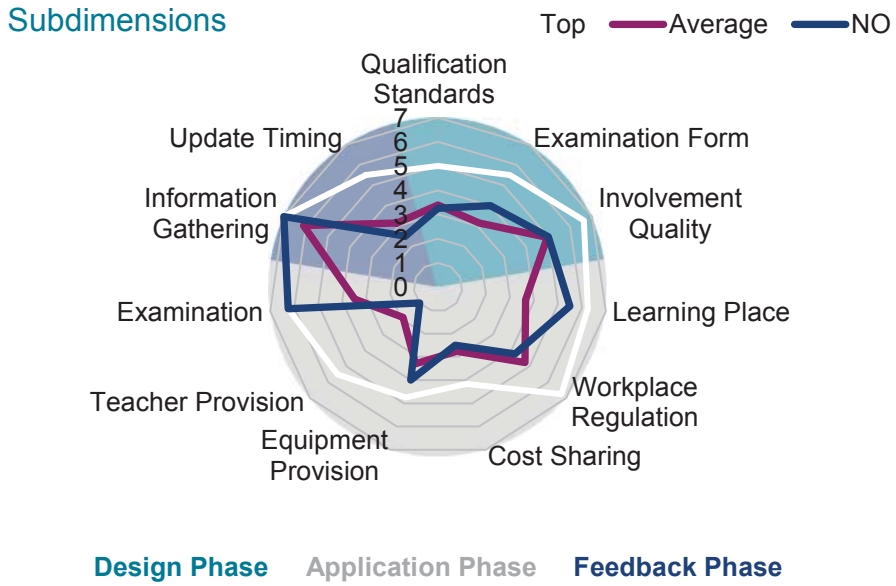
Norway's Apprenticeship Program—called the 2+2 System in the national context—lasts 4 years and is the most frequently chosen program within upper secondary VET (72.8%). The upper secondary VET sector as a whole absorbs 52% of a cohort and is thus quite important. This program's curriculum consists of 50% workplace training and 50% classroom education. As the informal name of the program suggests, students' time is divided between classroom and workplace in such a way that they first attend 2 years of fulltime classroom education and then change to the workplace for two years of fulltime training. When at work, their rights are defined by work contracts. During the classroom education phase, 50% of content is occupation-specific.

Key data about the program	
Time spent in workplace (vs. classroom)	50%
Work contract	Yes
Transferrable content (vs. specific)	50%
Classroom/workplace sequencing	Alternating
Frequency of workplace learning	After completing classroom ed.
Program duration	4 years (CEDEFOP, 2014f)
VET out of all upper secondary	52% (CEDEFOP, 2014f)
Program out of all VET	72.8% = 37.9% of all upper secondary
Number of curricula/qualifications	180 approximately (CEDEFOP, 2014f)

Note: Data in the first five rows comes from the KOF EELI responses.

Policy Implications for Norway

We cannot reasonably derive policy implications from the very small number of expert responses in the non-focus countries or without doing a case study of each country's VET. Therefore, we present the spiderweb of subdimension scores as a first look at what the KOF EELI can show, and we look forward to implementing it with more experts in the future.



Poland – School-based VET

	Score	Rank
KOF EELI	**4.45**	**5/20**
Curriculum Design Phase	**3.58**	**11/20**
Curriculum Application Phase	**3.76**	**7/20**
Curriculum Feedback Phase	**7.00**	**1/20**

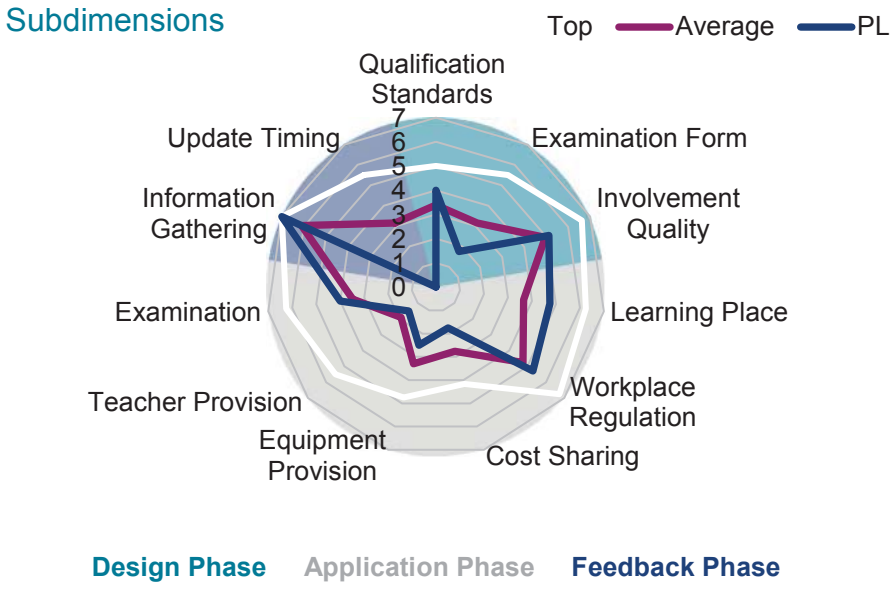
The Polish School-based VET Program with access to higher education—called Technikum in the national context—has a duration of 4 years. With an enrolment rate of 72.4% of all upper secondary VET students, it is the most important VET pathway within a system where upper secondary VET plays a major role at 56.5% of a cohort. The program consists of less than 50% of workplace training, but Technikum's students' rights are still defined by a work contract. In classroom education, 50% of content is occupation-specific and students alternate between classroom and workplace such that they are in firms at least semiannually.

Key data about the program	
Time spent in workplace (vs. classroom)	<50%
Work contract	Yes
Transferrable content (vs. specific)	50%
Classroom/workplace sequencing	Alternating
Frequency of workplace learning	At least semiannually
Program duration	4 years (CEDEFOP, 2014g)
VET out of all upper secondary	56.5% (CEDEFOP, 2014g)
Program out of all VET	72.4% = 40.9% of all upper secondary
Number of curricula/qualifications	200 (CEDEFOP, 2014g)

Note: Data in the first five rows comes from the KOF EELI responses.

Policy Implications for Poland

We cannot reasonably derive policy implications from the very small number of expert responses in the non-focus countries or without doing a case study of each country's VET. Therefore, we present the spiderweb of subdimension scores as a first look at what the KOF EELI can show, and we look forward to implementing it with more experts in the future.



Slovenia – Technical Upper Secondary

	Score	Rank
KOF EELI	**3.96**	**7/20**
Curriculum Design Phase	**5.59**	**1/20**
Curriculum Application Phase	**2.90**	**15/20**
Curriculum Feedback Phase	**2.50**	**15/20**

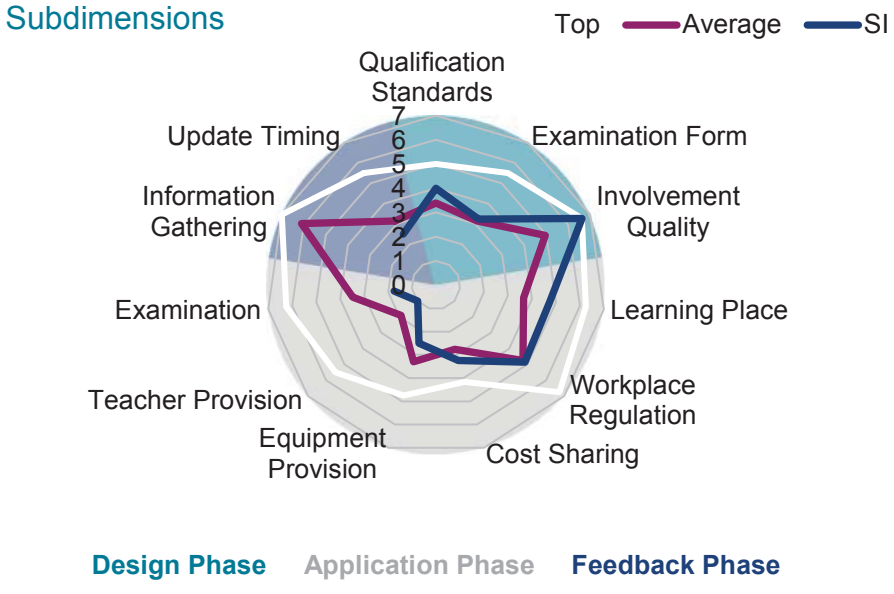
The Slovenian Technical Upper Secondary program, which is school-based and gives access to higher education, lasts 4 years. With an enrolment rate of 65.4% in VET, it is the most common program. VET as a whole accounts for more than half of a given cohort (59.7%). The program takes place mainly in the classroom since its workplace training share is less than 50%. Notwithstanding, the students of the Technical Upper Secondary program have their rights defined by a work contract when at work. In classroom education, over 50% of content is occupation-specific. Workplace training can take place before, after, or at least annually during classroom education.

Key data about the program	
Time spent in workplace (vs. classroom)	<50%
Work contract	Yes
Transferrable content (vs. specific)	<50%
Classroom/workplace sequencing	Alternating
Frequency of workplace learning	Before, after or at least annually during classroom ed.
Program duration	4 years (CEDEFOP, 2014j)
VET out of all upper secondary	59.7% (CEDEFOP, 2014j)
Program out of all VET	65.4% = 39% of all upper secondary
Number of curricula/qualifications	48 (CEDEFOP, 2014j)

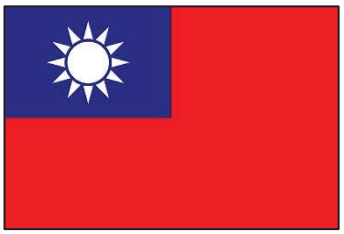
Note: Data in the first five rows comes from the KOF EELI responses.

Policy Implications for Slovenia

We cannot reasonably derive policy implications from the very small number of expert responses in the non-focus countries or without doing a case study of each country's VET. Therefore, we present the spiderweb of subdimension scores as a first look at what the KOF EELI can show, and we look forward to implementing it with more experts in the future.



Taiwan – Senior Vocational High Schools

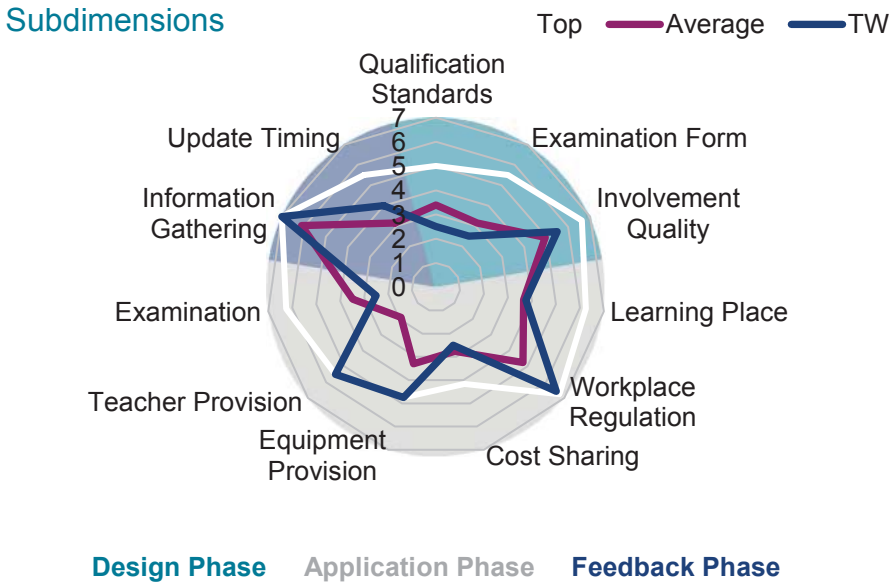


	Score	Rank
KOF EELI	**3.36**	**13/20**
Curriculum Design Phase	**3.30**	**14/20**
Curriculum Application Phase	**3.30**	**9/20**
Curriculum Feedback Phase	**3.58**	**9/20**

Taiwan's Senior Vocational High School Program has a duration of 3 years and is by far the main VET program at the upper secondary level. As such, in the national context it seems to be perceived as the normal VET option, and is thus not differentiated from other minor existing upper secondary VET programs in documents presenting statistics on upper secondary education. The VET sector as a whole plays a quite important role at the upper secondary level, absorbing 47.9% of all students at this education level. Senior Vocational High Schools' specific programs consist of less than 50% workplace training, but their students still have work contracts. In classroom education, over 50% of content is general, while students' time is divided between classroom and the workplace in such a way that they are in firms at least annually.

Key data about the program	
Time spent in workplace (vs. classroom)	<50%
Work contract	Yes
Transferrable content (vs. specific)	>50%
Classroom/workplace sequencing	Alternating
Frequency of workplace learning	At least annually
Program duration	3 years (MOE Taiwan, 2012 & 2013)
VET out of all upper secondary	47.9% (MOE Taiwan, 2012 & 2013)
Program out of all VET	Main (MOE Taiwan, 2012 & 2013)
Number of curricula/qualifications	6 school types (MOE Taiwan, 2012)

Note: Data in the first five rows comes from the KOF EELI responses.

Policy Implications for Taiwan

We cannot reasonably derive policy implications from the very small number of expert responses in the non-focus countries or without doing a case study of each country's VET. Therefore, we present the spiderweb of subdimension scores as a first look at what the KOF EELI can show, and we look forward to implementing it with more experts in the future.