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International models to rationalise VET qualifications, including occupational clusters: case studies – support document

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Publisher's note

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Overview

Recent vocational education and training (VET) reforms in many countries have focused on reducing the number of VET qualifications available and restructuring qualifications so that they better meet the needs of working life. This literature review provides examples of how VET qualifications have been rationalised in various countries and briefly explores the impact on qualification development.

There appear to be two main ways to rationalise VET qualifications:

- Reviewing qualifications and removing those not in use or are duplicates:

  – New Zealand reviewed all level 1 to 6 qualifications (certificates and diplomas), based on: either duplication and proliferation; workforce changes or social, industry and technological shifts; changes in legislation or government policy; lack of use of a qualification, for example, after two years; and/or a request from a developer.

  – England will be removing funding for qualifications that have either no, or low, numbers of enrolments.

- Reorganising qualifications into clusters, routes or vocational pathways. While all countries in this review use different terms, they all have the same underlying basis: to study a broad-based qualification, with the option of specialising later.

  – England started from scratch by defining T Level routes (technical study program) and developing the qualification content. This is outlined in detail in the relevant case study.

  – Other countries, such as Finland, restructured their qualifications by grouping similar qualifications and converting other qualifications into modules rather than full qualifications.

As much detail as possible has been provided in the case studies but information on the actual approach used to rationalise VET qualifications was scant for most countries.

In many of the case studies, the introduction of clusters for VET qualifications has occurred at the senior secondary level of education only, with these focused on providing a pathway to further vocational study, for example, England and the Netherlands. Nevertheless, Australia can still draw upon their approaches when determining future directions for its system. Finland is an exception: it has reorganised all of its vocational qualifications, from secondary school through to tertiary education, around clusters.

Lessons for Australia

Of the countries examined, clustering qualifications under related occupational groups appears to be the preferred approach. In this way, qualifications have become more broadly based and flexible, allowing for customisation through optional modules. By restructuring vocational qualifications in this manner, the number of overall qualifications has been reduced and they are seen to provide more career mobility for individuals and satisfy industry demand for labour. Key points for Australia to consider include:

- Modules are increasingly important once qualifications have been reduced. Most qualifications begin with common units related to general capabilities (that is, language, literacy and numeracy) and skills associated with several related occupations, after which specialisations through optional modules are provided. Modules are also used to rapidly respond to emerging skills needs or regional needs; see, for example, the Netherlands, where modules can be defined every three months and delivered to students immediately.

- In order to create clusters, occupational classifications can be used to initially define groupings of similar occupations. The skills and knowledge comprising these occupations can be mapped using an occupational database such as the United States-developed O*NET. Qualifications can then be developed from this information; see the England case study for a detailed overview of this. A similar approach has also been applied in the Australian context by Snell, Gekara and Gatt (2016).

- Qualifications need to be reviewed regularly to ensure they meet changing skill needs. Finland has moved from reviewing qualifications every five to 10 years to reviewing them continuously. New Zealand also has a regular review schedule.

- Up-to-date industry information relating to labour demand and workforce trends needs to be utilised when developing and reviewing qualifications. These insights should be informed but not dictated by industry. The Singapore Government manages this well, but also benefits from high levels of communication and collaboration between relevant ministries.

- The impact of qualification removal or of changes to qualification structure on those learners requiring additional support should be considered, given that the types of courses undertaken by this group generally have fewer enrolments (that is, bridging support, specialised courses for those with a disability), thus making them more likely to be reviewed for culling. This was raised in the review of the Finnish reforms and recently in England.

- Qualifications frameworks internationally tend to have fewer levels than the Australian Qualifications Framework (AQF) (for example, Singapore has six, Germany eight and Australia has 10). As the recent review of the AQF itself suggested, reducing the number of qualification levels may enable greater distinction between levels and reduce duplication of units of competency and qualifications (Australian Department of Education, Skills and Employment 2019).

Finland

Rationalisation of qualifications

Reason for reducing qualifications

The number of qualifications in the Finnish VET system grew significantly during the 2000s. Additionally, working life has changed, in that jobs are now more diverse and career paths are individualised (Finland Ministry of Education and Culture 2016). To address these issues, Finland reduced the number of VET qualifications (that is, vocational qualifications, further vocational qualifications and specialist qualifications) in its system from 351 to 164, as part of the extensive 2018 VET reform (Finland Ministry of Education and Culture 2019). These qualifications are comprised of 3200 modules (Autere 2019). These changes cover both senior secondary and post-school VET.

Approach taken

Along with reducing the number of qualifications, the reform also aimed to broaden qualification content to support individual learning plans and focus on competence rather than on learning outcomes, with the aim of responding more rapidly to changing needs in working life (Finland Ministry of Education and Culture 2019).

Keeping the goals of the reform in mind, a professional steering group reviewed the current qualification structure and proposed changes. As part of these changes, a number of former full qualifications were either merged or converted to 'competence areas' (specialisation areas) (Finland Ministry of Education and Culture 2016). As part of the development process, consultations were held with key stakeholders, such as employers, teachers, public authorities, and education and qualifications committees. Table 1 provides an example of how the qualification structure for business changed. The number of overall qualifications has been reduced greatly.

Table 1 Example of current and proposed business qualification structure in Finland

	Current situation	Proposal
Vocational qualifications	1. Bachelor's degree in Business administration - Customer service and sales expertise - Financial and office service expertise - Information and library services expertise	1. Bachelor's degree in Business
Further vocational qualifications	1. Professional Qualification in Document Management and Archives 2. Further Qualification in Finance 3. Professional Qualification in Hosting 4. Qualification in Real Estate 5. Professional Qualification in Local Management 6. Professional Qualification in Marketing Communication 7. Further Qualification in Sales 8. Professional Qualification for Secretary 9. Further Qualification in Financial Management 10. Further Qualification in Customs 11. Further Qualification in Foreign Trade 12. Further Qualification in Communication and Logistics Services	1. Professional Qualification in Hosting 2. Professional Qualification in Business 3. Vocational Qualification in Local Management 4. Further Qualification in Customs 5. Professional Qualification for Entrepreneurs

	13. Professional Qualification of Office Administrator 14. Further Qualification for Entrepreneurs	
Specialist qualifications	1. Specialist Qualification in Management* 2. Specialist Qualification in Management 3. Specialist Qualification in Trade Management 4. Specialist Qualification in Marketing Communications 5. Specialist Qualification in Cooking 6. Specialist Qualification in Finance and Human Resources 7. Specialist Qualification in Foreign Trade 8. Specialist Qualification in Communication and Logistics Services 9. Specialist Qualification in Business Management 10. Specialist Qualification in Business Counselling	1. Specialist Qualification in Hosting 2. Specialist Qualification in Management 3. Specialist Qualification in Business 4. Specialist Qualification in Business Counselling

*Effective 1 August 2017.

Note: the document was translated using Google Translate.

Source: Finland Ministry of Education and Culture (2016, p.14).

Impact on qualification development

Structure of qualifications

There are three main types of qualifications: vocational qualifications (initial vocational qualifications); further vocational qualifications; and specialist vocational qualifications. They are grouped in the following areas: education; humanities and arts; social sciences; business, administration and law; natural sciences; information and communication technologies (ICT); technology; agriculture and forestry; health and welfare; and service industries (Finnish National Agency for Education 2019).

All qualifications contain units of learning outcomes, which may be vocational units or common units (for initial vocational qualifications only). The vocational units contain both compulsory and optional units and the common units are composed of communication and interaction competency, mathematical and scientific competence, and social and labour market competency (Finnish National Agency for Education 2019).

Competence can be developed in differing ways, times and learning environments and students need to demonstrate their skills in a competence demonstration at practical work (Finnish National Agency for Education 2019).

This is a very modular type of qualification structure (as noted earlier, there are 3200 modules) and learners can either complete full qualifications, parts of them or combine parts of different qualifications to suit their needs. There is no difference between qualifications for young people and adults (Finland Ministry of Education and Culture 2019).

Since the reforms in 2018, updating qualifications is now a continuous process, whereas this previously occurred only every five to 10 years. The revised approach enables qualifications to respond better to the changing needs in the workforce and the results of skill needs anticipation. This process can take one to two years (Cedefop 2019a).

Institutional architecture

The following groups are involved in qualification development in the Finnish VET system:

- The government makes a decision on the structure of vocational qualifications.

- The Finnish National Agency for Education prepares qualification requirements for VET and determines which working life committee a qualification falls under.

- Working life committees are involved in developing qualification structures and requirements, and quality assurance. They consist of employer and employee representatives, teachers and self-employed people (Cedefop 2019a).

Reviews of system

The Finnish Education Evaluation Centre (Korpi et al. 2018) undertook an evaluation of the competence-based approach in Finland and noted the following key points:

- Overall, the direction of the VET reform is on the right path.

- The approach is strongest in operating practices and structures, such as student assessment, on-the-job learning and individualisation to meet learner needs, and less effective in monitoring, evaluation and results.

- There have been implications for teachers, with changes to their work and job descriptions due to the competence-based approach to vocational education. This has challenged the development of their capabilities.

- The availability of on-the-job learning places and workplace instructors, as well as the support provided to them, is a main challenge of the new system.

- Greater cooperation between education providers on issues such as operating methods and sharing materials would increase customer focus and operational efficiency.

- There is a risk that students requiring special support or guidance will not be paid the attention they require. There needs to be further information on how qualifications, study units and the practices in them provide support for students with difficulties in learning.

England

Rationalisation of qualifications

Reason for reducing qualifications

The Sainsbury Review in 2016 was tasked with providing advice on measures to improve technical education in England. At the time there were over 13 000 qualifications available for 16 to 18-year-olds but they held little value to employers or individuals. They recommended the introduction of 15 routes to cover both employment-based and college-based technical education (Independent Panel on Technical Education 2016). These routes are now known as 'T Levels' and are two-year, technical study programs, available alongside 'A Levels' (academic pathway), and apprenticeships for students who have completed the General Certificate of Secondary Education (GSCE) (Institute for Apprenticeships and Technical Education 2020c).

Recently, the Education Secretary, Gavin Williamson, announced that the government would be 'removing funding for qualifications that have no or low numbers of enrolments, [which] will help make sure students have a clearer choice of the qualifications on offer, and ensure they get the skills they need to progress' (BBC News 2020); 5000 qualifications have been highlighted for review, but concerns have been raised about the impact on those with additional learning needs, as some of the qualifications at risk of being axed are specifically for those with learning or physical disabilities (BBC 2020).

Approach taken

The information in this section has been derived from annex B in the 2016 *Report of the Independent Panel on Technical Education (Sainsbury Review)*.

The development of the T Level routes is based on occupational clustering. The following steps were taken to define and develop the routes:

- Stage 1: Defining the routes

Firstly, data on occupations in the UK economy from the Labour Force Survey (LFS) were used to examine the occupations to which the routes should lead.

This was followed by identifying occupations using the Office for National Statistics (ONS) Standard Occupational Classification (SOC) 2010. This classification system covers all occupations in which work is undertaken for pay or profit. The 4-digit SOC codes (most detailed level) were used to determine the occupations within technical education and to assign them to a route.

Given the focus of the routes is to lead to a skilled occupation, based on ONS information any occupations that were deemed to be too low-skilled or to require higher-level qualifications or significant experience were removed.

Using information from ONS on skills and tasks, along with job titles captured by occupational categories, the remaining occupations were analysed to develop a clustering of occupations considered to be homogenous in their requirements. These formed the basis of the routes.

- Stage 2: Testing the routes for alignment against apprenticeship standards, tech levels and technical certificates

The purpose of this step was to understand the extent of existing training provision for the occupations aligned to the routes and to identify disparities in provision. As the former UK Commission for Employment and Skills (UKCES) had mapped apprenticeship standards to 4-digit SOC codes, these were used to map the standards to the proposed routes. Tech levels and technical certificates were also mapped to the routes. Overall, it was found that, apart from one route in each scenario, all routes had at least three apprenticeship standards or one tech level or technical certificate mapped to them.

- Stage 3: Testing the homogeneity of skills and knowledge requirements between occupations within routes, using the United States occupational database O*NET

Due to limitations in the breadth and depth of information provided in the ONS structure and description of SOC unit groups, the US occupational database O*NET was used to enhance the understanding of the skills and knowledge requirements in occupations.

UK SOC codes are already mapped to US occupational classifications and, as they form the basis for O*NET, along with employee surveys, these classifications were used to analyse the routes.

O*NET contains information on 35 different 'skills' and 33 different 'knowledge' categories. Each skills and knowledge category is assigned an 'importance' and a 'level'. Importance describes the extent to which a particular skill or knowledge category is emphasised in an occupation, and level conveys the degree of competence needed. This can help to determine progression within routes. Using these data, the homogeneity of skills and knowledge compositions for the SOC codes grouped together within each route could be tested, ensuring the highest possible homogeneity between occupations within each route. This made it possible to develop meaningful training programs.

- Stage 4: Testing the industry coverage of the routes

To ensure no key industries were excluded, the industry coverage of the routes was tested. In order to do this, Standard Industrial Classification (SIC) codes were mapped to the SOC data. SIC codes classify businesses and other statistical units by type of economic activity. Around 44% of all industries were covered by the routes.

- Stage 5: Testing the future viability of the routes

'Future proofing' the routes was explored, using UKCES Working Futures data and the cross-government 'future of work' project. This provided information on the net change in employment, as well as the replacement demand. Overall, five routes were predicted to undergo a net decline in employment over the ten-year period, 2012—22, and all routes were predicted to see significant replacement demand.

Impact on qualification development

Structure of qualifications

The 15 T Level routes that have been established are:

- agriculture, environmental and animal care
- business and administrative
- catering and hospitality
- childcare and education
- construction

- creative and design

- digital

- engineering and manufacturing

- hair and beauty

- health and science

- legal, finance and accounting

- protective services

- sales, marketing and procurement

- social care

- transport and logistics.

The last four are to be undertaken mainly as apprenticeships (UK Department for Business, Innovation and Skills & UK Department for Education 2016)

At the start of each route, there is a two-year college-based program, which consists of core theory, concepts and skills for an industry area and includes English, maths and digital skills. This is followed by specialisation to a skilled occupation or set of occupations. Students must also complete an industry placement of at least 45 days (Department for Education 2019; UK Department for Business, Innovation and Skills & UK Department for Education 2016).

Occupational maps, showing the relevant knowledge, skills and behaviours within a route, have also been developed. Occupations with related knowledge, skills and behaviours have been grouped into pathways to show opportunities for career progression (Institute for Apprenticeships and Technical Education 2020a).

Currently the focus of the T Level routes is on 16 to 18-year olds, but the government is considering how to adapt the routes to adult learners (Foster & Powell 2018).

Post-school VET qualifications

Post-school technical education tends to occur at qualification levels 4 and 5 in the English system (technical qualifications, certificates, diplomas, foundation skills etc.). However, a review of post-18 education released in May 2019 highlighted that only a very small number of students study at this level: 'only 190,000 people [are] studying at Level 4 or 5 in 2016/17 (excluding apprenticeships), compared with approximately 1.14 million learners at Level 6 [bachelor degrees and degree apprenticeships]' (Post-18 Education and Funding Review Panel 2019, p.34). This has led to skill gaps at the technician level in England. Suggestions stemming from the review to improve the quality of level 4 and 5 education include: introducing fee caps; a single lifelong learning allowance; and a national regulator for all non-apprenticeship provision at levels 4 and above (Foster 2019). A further recommendation from consultations by the Department for Education is to align level 4 and 5 qualifications with employer-set occupational standards and rename them as higher technical qualifications, with the goal of their being available from 2022 when the first T Level students complete. These suggestions have yet to receive a response from government or be implemented (Foster 2019).

Institutional architecture

There are four main bodies involved in the T Level Routes. These are:

- the Institute for Apprenticeships and Technical Education, which is responsible for the procurement and management of the Technical Qualifications (TQ)

- the Department for Education, which manages the industry placements and some of the liaison with providers

- the Education and Skills Funding Agency, which also liaises with providers

- the Office of Qualifications and Examinations Regulation (Ofqual), which administers the accreditation and regulation of qualifications (Institute for Apprenticeships and Technical Education 2020b).

As part of its role, the Institute for Apprenticeships and Technical Education has T Level panels, which are comprised of employers and industry experts. These panels articulate the content outline for the core and occupational part of qualifications. The content outline is also open for public consultation. Once the content is finalised, awarding organisations are able to bid to develop the content (Institute for Apprenticeships and Technical Education 2020b).

Reviews of system

While delivery of the first T Level routes only began in 2020, a review of the approach has already been undertaken (see Richmond 2018). Overall, Richmond (2018) is supportive of T Level routes but believes that the government needs to be more ambitious in what they can achieve. The specific areas Richmond would like to see addressed encompass the following:

- In the past, the number of students taking on standalone technical qualifications has been limited, and providers will be under no obligation to offer T Level courses if there is no learner demand.

- Compulsory work placements of at least 45 days is an implementation challenge, as only around 8% of employers offer placements of that duration.

- T Levels are intended to allow progression to a higher/degree apprenticeship, higher-level technical qualifications and university degrees. The progression to university degrees is meant to be supplemented by a bridging provision, but there have been no details on this. Universities are uncertain whether T Levels will appropriately prepare students for university study.

- There needs to be a clearly defined purpose for T Levels and other forms of qualifications to differentiate their purpose and characteristics. Currently they contain overlapping information.

- In order to prepare properly, ensure their students have reached the required standards and make parents aware of T Levels, teachers require new T Level specifications and supporting materials 15 months before they are to start teaching them. The current implementation timeline does not allow for this.

New Zealand

Rationalisation of qualifications

Reason for reducing qualifications

In 2008, New Zealand's Ministry of Education, the New Zealand Qualifications Authority (NZQA), the Tertiary Education Commission and the Department of Labour commenced the planning of a targeted review of the qualifications system in response to industry concerns over the clarity and relevance of qualifications, the system's lack of user-friendliness and duplication of qualifications.

Seven changes recommended by this review were approved by the NZQA for implementation. The key changes affecting qualifications were: to establish a unified New Zealand Qualifications Framework (NZQF); to require mandatory periodic reviews of qualifications; and to reduce the volume of qualifications (New Zealand Qualification Authority 2017). The NZQF applies to vocational education delivered in New Zealand both in school and as adult education.

Approach taken

A qualification review process was developed by NZQA and undertaken in collaboration with the qualification developers and their stakeholders. NZQA was responsible for:

- developing the schedule for qualification review

- tracking progress

- liaising with qualification developers

- reviewing qualification review plans

- considering and approving recommendations for changes to qualifications

- supporting review capability.

Qualification developers were responsible for:

- planning and conducting the initial review and periodic reviews

- submitting the review plan to NZQA

- coordinating and communicating with relevant stakeholders

- notifying NZQA if any mandatory stakeholder chose not to participate

- reporting the outcomes of the review to NZQA

- implementing approved recommendations

- agreeing to accept outcomes of reviews

- nominating a delegate if developer chose not to participate

- bearing the costs of reviews (New Zealand Qualifications Authority 2011).

Qualification developers were given six months to undertake a review, beginning on a NZQA-stipulated date. Qualifications that failed to meet the deadline were updated to 'expiring' status on the NZQF list. The three-stage review process to review the 4610 qualifications (levels 1—6) commenced in 2011 (New

Zealand Qualifications Authority 2011) and was completed in 2018 (New Zealand Qualifications Authority 2019a).

- Stage 1: NZQA published a schedule of qualifications to be reviewed, based on the review date specified on the NZQF and/or one or more of the following:
  - duplication and proliferation
  - workforce changes or social, industry and technological shifts
  - changes in legislation or government policy
  - lack of use of a qualification, for example, after two years
  - a request from a developer.

- Stage 2: representatives from members of review working groups developed a plan with timelines and an approach, conducted the review and submitted a review outcome report to NZQA with recommendations for change. Review working groups comprised industry training organisations (ITOs), relevant industry bodies, standard setting bodies, education and training providers, and other representatives.

- Stage 3: developers implemented the agreed recommendations and submitted any new or revised qualifications to NZQA for approval, following which a regular qualification review process commenced (Korero Matauranga 2019).

Outcome of this review: reduced duplication and proliferation of qualifications, taking qualification numbers from 4610 in 2011 to 909 in 2020 (New Zealand Qualifications Authority 2019a); simplified access to qualifications by consolidating all New Zealand qualifications into one list on the NZQF.

Challenges in this review process: ensuring qualification development is evidence-based, maintaining the ability to take a fresh look at existing qualifications; planning and governance; consultation with stakeholders; and communication and information dissemination.

Impact on qualification development

Structure of qualifications

As part of the rationalisation of qualifications in New Zealand, a regular review schedule has been established to ensure that qualifications maintain relevance. The policy requirement that new qualifications do not duplicate existing qualifications will also contribute to keeping qualification numbers low over time.

New principles now underpin qualification design:

- based on needs
- clear graduate, education and employment outcomes
- flexibility — programs lead to the award of qualifications
- collaborative development
- accountability and improvement (New Zealand Qualifications Authority 2014).

Institutional architecture

Several bodies are involved in the New Zealand qualifications development:

- The New Zealand Qualifications Authority (administering the New Zealand Qualifications Framework) sets the guidelines for qualification development and approves qualifications.

- Qualification developers manage the review of qualifications with selected stakeholders and can be any of the following entities: ITOs, institutes of technology and polytechnics, private training establishments, wananga[1], government training enterprises, and universities.

Qualification developers invite mandatory and relevant stakeholders to contribute to the review of qualifications.

Reviews of system

Following the completion of the targeted review of qualifications in 2018, an evaluation of the review outcomes was commissioned in 2019. This review project is still underway, but a consultation paper released in July 2019 outlined eight proposals to further enhance the qualifications framework, including increased embedding of transferable competencies. Some respondents to this proposal expressed concern about proliferation of qualifications following the recent work to reduce numbers. However, many supported the proposal, if quality-assured, as they considered that it would promote flexibility and greater employment opportunities for graduates (New Zealand Qualifications Authority 2019b). A final report responding to feedback to the discussion paper is yet to be released.

Occupational clustering

As a side note, in 2012 the New Zealand Government implemented Vocational Pathways for schools, which maps six industries to assessment standards in levels 1—3 of the National Certificate of Educational Achievement (NCEA). The aim of this activity was to help students to understand how the skills they were acquiring through NCEA applied to the world of work and the qualifications and skills required by industry. An early review of this program showed promising results, with the number of students achieving a Vocational Pathways Award doubling between 2012 and 2013 (New Zealand Ministry of Education & Industry Training Federation 2014). No later review of the pathways approach has been published. Further information about the pathways can be found at: <http://youthguarantee.education.govt.nz/>.

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[1] Wananga are tertiary institutions that provide education based on Maori traditions and customs (New Zealand Qualifications Authority 2020).

The Netherlands

Rationalisation of qualifications

Reason for reducing qualifications

A new qualification system for upper secondary VET in the Netherlands was introduced in August 2016 to allow for better transparency and functionality of qualifications (Smulders, Cox & Westerhuis 2019). This led to a reduction in the number of VET qualifications by 30% (Cedefop 2018).

These changes do not apply to post-school VET qualifications, where curriculum development and assessment of professionally oriented higher VET qualifications is the responsibility of the universities of applied science (Cedefop 2018).

Approach taken

Limited information can be found on the approach taken to reduce the number of qualifications (that is, did they rework the existing qualifications as did Finland, or did they draft new qualifications as did England?), although it is known that qualifications are now clustered (Smulders, Cox & Westerhuis 2019).

In terms of developing the content for qualifications, panels of industry and teaching experts are convened by the Cooperation Organisation for Vocational Education, Training and the Labour Market (SBB) to draft the expected knowledge, skills and behaviours for each vocational/occupational standard in their market segment (currently 34 market segments) (SBB 2020b; Smulders, Cox & Westerhuis 2019; Independent Panel on Technical Education 2016). Qualification profiles (educational standards) are then drafted by social partner and VET representatives from the nine sector chambers and are adopted by the education ministry (Smulders, Cox & Westerhuis 2019). The curricula are then developed by VET colleges and training firms, based on these qualification profiles (Smulders, Cox & Westerhuis 2019).

Additionally, from 2018, VET colleges have been able to tailor national qualifications in cooperation with the regional business community to help address regional needs. At least 60% of the teaching time of these new qualifications should be based on the national qualifications (Smulders, Cox & Westerhuis 2019).

Impact on qualification development

Structure of qualifications

Qualifications are competence-based and consist of a 'general part (language-, numeracy-, citizenship- and career management skills), a basic vocational part, applicable for all occupations in the qualification, several profile modules (specific for the profile within the occupation) and optional modules' (Smulders, Cox & Westerhuis 2019, p.43).

At July 2018, there were 179 qualifications, 491 profiles (specialisation within a qualification) and around 1000 optional modules. The optional modules are relevant for a number of qualifications and are jointly developed by companies and educational institutions to enable a rapid response to emerging needs in their region. They have the capacity to be defined every three months and delivered to students immediately (Smulders, Cox & Westerhuis 2019).

Institutional architecture

The following groups are the main bodies involved in developing VET qualifications in the Netherlands:

- The Ministry of Education, Culture and Science governs the national system for qualifications (Independent Panel on Technical Education 2016).

- The Cooperation Organisation for Vocational Education, Training and the Labour Market works with VET schools and the labour market on executing the following legal tasks:

  - advise, accredit and coach work placement companies

  - develop and maintain the qualification structure

  - provide research and information on the labour market, work placement and efficiency of VET programs

  They also advise on linking VET and the job market to the Minister of Education, Culture and Science (SBB 2020a).

- Additionally, there are nine sector chambers within SBB who help to develop the occupational profiles (Smulders, Cox & Westerhuis 2019). The sector chambers cover: technology and built environment; mobility, transport, logistics and maritime; healthcare, welfare and sport; trade; IT and creative industry; food, greenery and hospitality; business services and safety; specialist craftsmanship; and, entrance (SBB 2020b).

Reviews of system

No relevant information could be found at this time.

Norway

Rationalisation of qualifications

Reason for reducing qualifications

In 2015, changing skills and knowledge requirements in scientific disciplines and in working life, as well as emerging knowledge fields, were cited as reasons for the Norwegian Directorate for Education and Training to commence a review of vocational subjects and competencies. Ultimately, the review made several reform recommendations, including to reduce and make more uniform the number of competency objectives and to develop a national strategy for content development (Norway Ministry of Education and Research 2015). These efforts were focused mainly on the VET pathways available to secondary school students, although the standards may be applied to adult education too.

Furthermore, a later white paper (2017) on senior vocational college education recommended that local businesses and industries must be represented on college boards and contribute to academic priorities (Norway Ministry of Education and Research 2017).

The Norwegian Qualifications Framework (NKR) has seven program levels, each of which describes three areas of competence: knowledge, skills and general competency (Reegård & Rogstad 2019). Qualifications that are mapped to the NKR benefit from comparability with other Norwegian and European qualifications. Much of the review work on the NKR in recent years has focused on 'referencing' to the European Qualifications Framework (EQF) (Cedefop 2019b).

The NKR framework itself states: 'The Norwegian education … is simple and transparent and has relatively recently undergone changes that have resulted in greater coherence and simplification. The NQF has therefore not been developed in order to reform the system' (Norway Ministry of Education and Research 2014).

Approach taken

The approach to clustering vocational education was not undertaken at the qualification level. Rather, reform activity focused on a learning outcomes approach by integrating key interdisciplinary topics — sustainable development; multicultural society; and public health and wellbeing — into subject matter training delivery. Additionally, the curriculum embeds cross-curricular core elements based on four areas of competency:

- subject-specific competence

- competence in learning

- competence in communicating, interacting and participating

- competence in exploring and creating (Norway Ministry of Education and Research 2015).

Education and training stakeholders and labour market representatives were involved in all stages of the development process (Cedefop 2019b).

Impact on qualification development

Structure of qualifications

Norway's vocational education system is highly decentralised, and VET, including apprenticeships, is fully integrated into the upper secondary education system and accessed by approximately half of all those entering upper secondary education (Reegård & Rogstad 2019). Due to its integration with schooling, the content of VET teaching is influenced by the national education curriculum and mapped to the NKR for validation. Higher vocational education is a level above secondary education; the program content is managed largely by individual college boards and may be mapped to the NKR if they choose to benefit from mutual recognition and mapping to the European Qualifications Framework.

Eight broadly composed vocational programs provide the entry point to vocational education from senior secondary school. The first year delivers general education and introductory knowledge, divided into three categories: 'common core subjects' are the same for all programs; 'common programme subjects' cover trade-specific theory and practice; and 'vocational specialisation' allows pupils to move between school and the workplace. In the second year, further specialisation competencies are delivered, steering the student towards an apprenticeship in a specialised area in year three (Haukås & Skjervheim 2018).

Institutional architecture

Several agencies play a role in developing and maintaining the qualifications framework and in the development of subject curricula:

- Norway Qualifications Framework

- Norway Ministry of Education and Research, which regulates the NKR

- Norwegian Agency for Quality Assurance in Education (NOKUT), which performs quality assurance of tertiary vocational schools and is the secretariat for the NKR

- National Council for Tertiary Vocational Education, which liaises with social partners to develop higher vocational education standards

- VET advisory bodies, comprising business, industry, unions and the public sector representatives, which inform NKR development.

Reviews of system

The Norwegian Government had planned an exercise mapping the implementation of the NKR for 2019 (Cedefop 2019b). No results from this review are available at present.

Occupational clustering in other systems

Information on the following countries has been provided as they have introduced some form of occupational clustering to their qualifications but not necessarily with the aim of reducing the number of VET qualifications.

United States

Information on the approach taken in the United States was not as readily available as some of the other countries, particularly as it differs by state. Post-secondary career and technical education (CTE) (equivalent to VET), delivered in community colleges, tends to serve two main purposes: transfer into a 4-year college degree or preparation for work (Schwartz & Hoffman 2019). The main structuring framework is based around 16 career clusters, which are designed to provide pathways rather than reduce qualifications. Qualification development differs by state and there is no information available on this.

National Career Clusters Framework

The National Career Clusters Framework is a tool used for organising CTE programs, curriculum design and instruction and is used across most states (Greenbatch & Tate 2019). There are 16 career clusters and 79 career pathways. Each cluster contains occupations that are in the same field of work or require similar skills, and their goal is to provide students with the knowledge and skills for a variety of jobs within an occupational area (Greenbatch & Tate 2019). The 16 career clusters are:

- agriculture, food & natural resources
- architecture & construction
- arts, A/V technology & communications
- business management & administration
- education & training
- finance
- government & public administration
- health science
- hospitality & tourism
- human services
- information technology
- law, public safety, corrections & security
- manufacturing
- marketing
- science, technology, engineering & mathematics

- transportation, distribution & logistics (Advance CTE: State Leaders Connecting Learning to Work 2020a)

Employer and post-secondary validated standards were developed for the clusters. These consisted of 'foundation standards', with the shared knowledge and skills for all occupations in a cluster, and 'pathways standards', with the specific knowledge and skills for particular careers within the cluster (United States Department of Education, Office of Career, Technical, and Adult Education 2015). These have now been replaced by the Common Career Technical Core (CCTC), which was informed by state and industry standards and developed by a diverse group of teachers, business and industry experts, administrators and researchers from 42 states and the District of Columbia and Palau (Advance CTE: State Leaders Connecting Learning to Work 2020b).

Singapore

Work to reduce or prevent the proliferation of qualifications has not been a focus in the Singapore vocational education system due to its system structure, which places economic drivers at the heart of training standards development. Instead, the Singapore Government's agenda to promote workforce flexibility, creativity and innovation has driven the development of industry clusters and the inclusion of innovation modules in training delivery under its SkillsFuture initiative (Tucker 2019). Both secondary school and adult students are captured by the qualification framework.

SkillsFuture

The Singapore Government has designed a system that tightly links qualification development and review to economic policy, a system also informed by industry. The Ministry of Manpower gathers information from economic agencies on critical industry needs, which is used to inform not only the development of qualifications but also the number of training places offered in pre-employment training and continuing education and training (World Bank 2015).

Through its industry transformation maps (ITM) strategy, the government produces 23 industry-specific roadmaps, which are organised into six industry clusters to encourage collaboration between like sectors (Min 2018). These clusters are mapped to a skills framework developed by the government in partnership with employers, industry associations, unions and professional bodies. The framework enables individuals to seek information on employment, pathways, occupations, job roles, existing and emerging skills and competencies, as well as relevant education and training programs (SkillsFuture Singapore 2019b).

Structure of qualifications

The Singapore Workforce Skills Qualifications (WSQs) is the national accreditation system and is based on standards developed by the Workforce Development Agency (WDA). It describes six levels of competency across approximately 34 industry frameworks. WSQs stipulate workforce skills standards: foundational and cross-industry skills; and industry-specific and occupation-specific competencies. WSQs comprise short training modules to facilitate self-paced learning (SkillsFuture Singapore 2019a). Statements of attainment (SOA) are awarded, and relevant SOAs can be combined to achieve a full WSQ qualification. WSQs are aligned to the Skills Framework (World Bank 2015).

Three fundamental principles guide the design of WSQ qualifications: relevance, flexibility and consistency. Feedback on the relevance and suitability of qualifications is gathered from employers twice a year, and every five years the quality assurance framework itself is reviewed (Renold et al. 2016).

The Institute of Technical Education (ITE) offers courses that are grouped into the six clusters identified through the ITM. Although the ITE does not use the WSQ standards, it has established mutual recognition to enable individuals to pursue recognition for their achievements (World Bank 2015). In the ITE, academic advisory committees, comprising employer representatives, professionals and specialists from the respective industries, examine and approve the syllabuses of courses for occupational clusters (Singapore Institute of Technical Education 2020). The application of the career clusters allows students to gain a useful qualification yet remain responsive to evolving skills demands (Renold et al. 2016).

Institutional architecture

Several government agencies work together to develop qualification frameworks and standards:

- The National Manpower Council (headed by the Ministry of Manpower) has members from the ministries of trade and industry, finance, and education. It collects insights from across the ministries to inform WSQ development and training places.

- SkillsFuture Singapore provides WSQ funding and quality assurance, and trains, develops and assesses skills and competencies, which are certified by employers, unions and professional bodies.

- The Singapore Workforce Development Agency quality-assures the WSQ.

- The Institute of Technical Education delivers training and designs curriculum informed by academic advisory councils.

- The Ministry of Education appoints boards of ITEs.

- Industry partners have memorandum of understanding partnerships with ITE to provide learning and development opportunities for students and ITE staff.

Reviews of system

The Singapore Government has taken a continuous improvement approach to its vocational education system and regular reforms have occurred since the 1990s (Tucker 2019). It appears there has been no review of the duplication or proliferation of qualifications specifically, or on how well qualification clustering by industry has performed.

Germany

Like Norway, Germany has a vocational education system that is well integrated into the schooling and lifelong learning sectors. In 2012, the government and stakeholders agreed to align all educational standards by including a German Qualifications Framework (DQF) indicator on all certificates. In 2017, all general school leaving certificates were allocated levels 2—4 from the DQF, with adult education delivering qualifications across all levels.

The DQF is mapped to the European Qualifications Framework and has eight qualification levels, which are described in learning outcomes. The framework is not regulatory and was developed by the federal government in collaboration with trade and industry organisations and academic experts (Germany Federal Institute for Vocational Education 2019).

A DQR federal government—federal state coordination group oversees a DQR working group, where decisions and resolutions relating to the development and implementation of the qualifications are discussed and adopted.

Qualification structure

DQR qualifications span eight levels and describe the competencies required to acquire the qualification. There are two categories of competency: professional competency (knowledge and skills) and personal competency (social competence and autonomy) (Schueller 2018).

Reviews of the system

No formal review of the DQR has been carried out since 2012. However, an interim analysis of the impact so far indicates that the changes have increased communication and trust across education sectors, increased transparency and the understanding of qualifications, and increased the visibility and esteem of VET (Schueller 2018).

Denmark

The Danish vocational education system employs the dual model—industry and employers play a key role in the development of vocational education standards. Nationally recognised qualifications are developed centrally, with input from many stakeholders, including vocational institutions and students. However, training providers can adapt courses to suit local needs.

Qualification development is steered by an advisory council (REU) appointed by the Minister of Education. The Ministry of Education reviews and approves applications for new or updated qualifications. The advisory council comprises industry sectors, employers, teachers and student representatives. Around 50 trade committees feed insights from industry into the council, providing advice on outcomes, assessment methodology and program duration. This is supplemented by skills demand and labour supply analyses, but in 2016 a review noted that little was known about how individuals apply VET-acquired transferable skills to different occupations when the market demands this (Madsen 2016).

The Danish Government undertook a major reform of VET in 2015, resulting in the system's approximately 110 qualifications being aligned to four broad vocational routes: care, health and pedagogy; office, trade and business service; food agriculture and experiences; and technology, construction and transportation. The first six months of study in all routes is the same and allows students to change their minds after commencing study and/or to move to the second part of study if they had commenced previously (Denmark Ministry of Education 2014).

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