TRAINING IN CONSTRUCTION CRAFTS

ERASMUS+ PROJECT REPORT

European Commission

HISTORIC ENVIRONMENT SCOTLAND | ÀRAINNEACHD EACHDRAIDHEIL ALBA

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TRAINING IN CONSTRUCTION CRAFTS

A COMPARATIVE STUDY OF TRADES TRAINING IN NORWAY, POLAND AND SCOTLAND.

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THE PROJECT AND ITS PARTNERS

The Traditional Building Skills Project (2018–2020) was a training and collaboration initiative funded by the European Commission via the Erasmus+ programme. The aim of the project was to address a recognised shortage of traditional buildings skills in Europe by developing innovative educational activities and courses in identified craft skills, and then delivering these to young learners (12/13 and 16/17 years old) through transnational collaboration between partners in three countries: Norway, Poland and Scotland.

The project involved the development of pilot courses in craft skills such as stonemasonry, mortar mixing and traditional roofing for a range of learning levels from high school to college, as well as a training package to upskill tutors and enable them to deliver the courses. Over the course of the project, the pilot courses were delivered at St Andrew's RC High School in Fife, and at Fife College. The students from St. Andrew's, Voss Vidaregåande Skule in Norway, and ZDZ Toruń in Poland took part in blended mobility visits to each of the other partner schools and countries, to meet their fellow pupils in traditional building skills and to experience the training environment and expertise of other countries and cultures. The Scottish partners were Fife Council, Fife College, the Scottish Lime Centre Trust, St Andrew's RC High School and Historic Environment Scotland; the Norwegian partner was Voss Vidaregåande Skule; and the Polish partner was ZDZ Toruń.

Fig. 1: Norwegian project partner, Voss Vidaregåande. Skule.

INTRODUCTION TO THE REPORT

This report is one of the main outputs of the Erasmus+ Traditional Buildings Skills project. Because one of the main activities of the project was the exchange and cooperation of international partners to jointly address a European-wide issue, the opportunity was taken to examine how each of the participating countries addresses the training of craft skills.

Each country has a rich traditional built heritage which is grounded in centuries of skilled craftsmanship, and each country takes its own approach to preserving the skills to look after that heritage, and to cultivate a robust and skilled workforce in construction crafts. By examining the approaches of each country and analysing their relative strengths and effectiveness, it was intended that the lessons learned through international exchange over the course of the two year project could be collected, further investigated and presented in the form of a report. The report would look at the relative merits of the three different systems, and draw out conclusions and lessons learned about how craft training in Scotland might benefit from some of the approaches taken abroad.

The structure of the report is very simple. A range of research questions was decided upon beforehand that would give a comprehensive picture of craft training in any one country. These questions were then investigated for each of the three countries, and the system of training described for each. Then a comparative analysis was conducted that draws together the strengths and weaknesses of different approaches. Finally, a range of recommendations was made for how Scotland might take the lessons gained from other countries' methods, and apply them to improve its own approach to training.

The report, although intended to be accurate and representative, was compiled under certain limitations. The majority of the research was desk-based, supplemented where possible with interviews and insights from the project partners. Skills and training reports, and especially documentation related to 'new and improved' school curricula, tend to be written by stakeholders themselves, and automatically offer a more positive and hopeful perspective. The description of a learning system's curriculum and intentions, may paint a different picture from how well that system works in practice. Furthermore, many of the resources were consulted in translation, which may have caused misunderstandings of the systems described. If any such errors persist, they are unintentional, and every effort was made to genuinely understand and represent the situations in each of the three countries.

“Each country has a rich traditional built heritage which is grounded in centuries of skilled craftsmanship.”

EXECUTIVE SUMMARY

NORWAY

Norway incorporates craft into the school curriculum from the lower secondary level (13–16 years old) in the form of electives that focus on handworking and manual skills, rather than the pursuit of a particular trade. Although formerly separated into academic, mercantile (business) and vocational, for several decades now upper secondary education has merged these three pathways into a single integrated schooling system, deliberately encouraging greater mobility between paths, and increased access to higher education for vocational students.

Apprenticeship is likewise integrated into the schooling system, and is considered a form of tertiary education. Apprentices spend one to two years in general vocational education trying different trades before settling on a path, and once they have selected their trade, the onus is on the state to arrange the apprenticeship opportunity. Good local distribution of resources in a geographically challenging country, as well as prioritising engagement with local employers, creates a robust system that turns out mature-minded skilled individuals, and contributes to a cultural sense of value in vocational work, which 43% of Norwegian students elect to pursue.

Fig. 2: Bergen, Norway.

POLAND

Inversely to much of Europe, the contraction of Poland's construction sector and the export of much of its skill base has left the industry vulnerable. Recent reforms look at protecting the interests of SMEs, and raising the esteem of craft through unique measure such as special incentives for generationally family-owned firms.

Craft education in Poland follows a traditional model of compulsory general education up until a certain point, and then a clear split between academic paths and vocational paths. Recent and ongoing educational reforms have lowered by one year the age at which students make this decision, in addition to pushing for better engagement with employers, and requiring craft teachers to spend time working in industry to keep up their skills. Unlike Norway, but more typically, apprentices in Poland are employees first and students second, although almost all are formally enrolled in further education and spend roughly two days learning and three days working over the course of their (usually) three-year apprenticeship.

Fig. 3: The Ethnographic Museum in Toruń, Poland.

SCOTLAND

Recent educational reform in Scotland has sought to make learning more flexible and useful. In broad-phase education, young learners participate in a 'technologies' curriculum, which exposes them to concepts of handworking, model building, and design. The 'technologies' curriculum continues into the senior phase (13–16 years old), the offering of which is limited to working in metal, wood and plastic, and can be highly variable depending on the capabilities and resources of the individual school. Also at senior phase, students can begin to earn vocational qualifications through the recently updated Level 4 and 5 qualifications which form part of the overall Foundation Apprenticeship. The Foundation Apprenticeship emphasises the development of meta skills through engagement with colleges and employers, and a project-based learning approach.

Apprenticeship is linked inseparably with course enrolment at a college, and is dependent upon a young person's ability to find and/or arrange employment for themselves, a process which asks great initiative of 16-year-old school leavers, and can be complicated by the limitations of needing to find an employer and a college within geographic proximity – a particular challenge for Scotland with its challenging geography and uneven distribution of population and skills. As a form of employment, apprenticeship is vulnerable to economic forces, which could see small businesses reluctant to take on a training obligation and associated management needs during difficult times; already only around a quarter of construction firms take on apprentices at all. Lack of qualifications or training pathways, accompanied by a scattered funding model which is more easily understood and accessed by well-resourced large firms (grounded in new construction) than by small to medium sized enterprises (SME) (who employ the majority of apprentices and whose bread and butter is repair and maintenance) further contributes to a shortage in traditional craft skills.

COMPARISONS

Rather than being valued in their own right culturally as well as economically, in countries such as the UK and Poland vocational work and education has come to be seen as a lesser alternative to university education and the professions that follow. This has contributed to a situation in which trades struggle to recruit skilled candidates through the education system. In contrast, craftspeople enjoy greater cultural prestige in Norway, making the profession attractive. Trades generally highly regarded and often sought as professions, with more than half (51%) of Norway's upper secondary students enrolled in vocational education training (VET) rather than academic programmes.

Many countries have experienced a flight to the cities over recent decades, leaving rural places vulnerable and under-resourced. While the effect has been severe in Scotland, it has been less so in Norway, which has a more evenly distributed population and consequently more robust rural economies and skills bases backed up by deep investment in connectivity and accessibility, as well as the availability of flexible learning models. In Scotland, however, without a training pathway in a local area, there is no pipeline of talent to become employed in that area, and vice versa: college-based training requires an apprenticeship, which requires local enterprise. If this is not present, there is little point in offering a college course.

Education Scotland, Skills Development Scotland (SDS), and the Construction Industry Training Board (CITB) can take a more proactive role in overcoming some of these issues: targeted investment and funded partnership can get the ball rolling, and find accessible solutions to the perpetual problem of training being locally restricted by requiring bodies in classrooms and in the workplace. If these two are not conveniently located, at the present moment no solution exists to overcome this physical, geographical limitation.

Differences among the three systems affect the preparation of a capable workforce through apprenticeship. A crucial distinction is the handling of the transition of learners from general secondary school, into more specialised vocational preparation. In Scotland and Poland, there is a clear break between the end of general education and the commencement of VET. Although reforms are working toward improvement, offerings at the secondary school level are often variable, shallow, and offer limited engagement with employers or project-based learning.

In Scotland, those on a VET track go straight out into the workforce at age 16, in Poland at age 15, and the onus is on these young workers to navigate and arrange a system of continuing education for themselves. Norway, in contrast, keeps VET learners solidly within the education system while allowing time and opportunities to better understand the sector. This more gradual path reduces risk of student disengagement and arms students with meaningful skills by putting them on work placements rather than into simulated workshop environments. It also puts the responsibility on the state to find appropriate training pathways and apprenticeship placements through employer partnership, rather than requiring the same initiative of 16-year-olds.

In order to create feasible and attractive training pathways into traditional skills, Scotland can take further its existing initiatives, and look especially to lessons from Norway and Poland for what creates a vibrant and sustainable craft tradition:

1. Fight for the cultural status of craftspeople and vocational workers by reinforcing an image of skilled manual work as fulfilling and important.
2. Increase remote access and overcome geographical limitations.
3. Introduce earlier, more meaningful exposure to vocational subjects such as construction crafts in schools.
4. Put in place measures to protect and foster rare or endangered crafts through funding an incentives, rather than forcing them to compete against large-volume market-driven occupations.

The below report elaborates on the above themes, as well as other such as in-sector training, sectoral support systems, funding models, and teacher training. Consideration of these factors and taking the measures outlined above and expanded upon in the conclusion, will raise the esteem and increase opportunities in trades that are a significant and necessary part of a vibrant construction sector, and will result in a more skilled and fulfilled population for Scotland.

COUNTRY SUMMARY: NORWAY

SECTOR OVERVIEW

As in most countries, Norway has a large and growing construction sector, with employment numbers in the sector rising from 191,000 in 2008 to 212,000 in 2014, a growth of 11% despite the global downturn which particularly affected the construction industry. Within this, trades make up just over half of all employed, with carpentry as the single largest, employing 11% of the total sector.[1] Other traditional trades crucial to the industry are iron fixers, stonemasons, and plumbers, among other crucial modern trades such as scaffolders, electricians, and machine operators.[2] Practitioners in trade or holders of a journeyman's or trade certificate tend to enjoy high status culturally.[3]

However, by 2019 it was noted that the construction industry was facing a general shortage, estimated at around 14,300 people, and that this shortage was also represented within the skilled trades including carpentry.[4] Projections to 2030 predict that this shortage will increase.[5]

Unable to find skills at home, specialised construction projects often turn to foreign expertise.[6] With wages in the EU10 – including Poland – rising, the predicted trend is for increased difficulty in attracting skilled foreign workers.[7] It has been widely noted that immigrant workers are vastly less likely to hold qualifications, or to work in areas of trade that require qualification. However, a large part of this discrepancy is due to lack of a system to recognise and convert qualifications and training completed in other countries. Steps have been taken to address this, and from 2016, the Norwegian Agency for Quality Assurance in Education (NOKUT) has been able to approve foreign vocational qualifications in three construction trades: concrete worker, carpenter, and plumber. Such a step is expected to greatly reduce the statistical disparity in qualification level for foreign and Norwegian-born workers.[8]

The sector is also unevenly weighted by age, with a higher proportion of young people in manual and craft roles, while the percentage in managerial and educational positions increases as age moves upward.[9] Unsurprisingly, the majority of employment in construction is on a small scale, with SME's dominating, and approximately 200,000 workers operating in approximately 50,000 registered companies – an average company size of four people.[10]

Participation in the construction industry is heavily gender weighted, with women making up 8% of employment in the industry as a whole, and in the craft trades only 2%. Moreover, these proportions have not substantially changed in the past 15 years.[11]

VET IN SCHOOLS

The Norwegian school system is made of three phases through the upper secondary level (age 19). At barneskole, or primary school, from ages 6–13, children are put through a low level general studies curriculum including topics like English, mathematics, geography, and science. At ungdomsskole, or lower secondary school, from ages 13–16, students begin to be graded for their work, and on top of the normal curriculum take one additional language and one elective.

Elective subjects are highly variable and depend on the capabilities of the individual school. Electives can be either theoretical or practical, and can encompass elements of design, craft, and handworking, though they are generally not presented in the context of learning a specific trade. Those students on a more practical track generally can take courses in work skills (arbeidslivsfag) instead of the second language.

This work skills course focuses on practical elements such as accountancy, entrepreneurship, digital skills, and workplace ethics.

After completion of lower secondary school, students move to videregående skole (upper secondary school), the vast majority of which are state run, and to which they can apply based on their grades and location in the country. Prior to 1994, school at this level was split into general academic, mercantile (accountancy and business), and vocational. A major reform merged the three into a single system, with the goal of introducing more theory into vocational education and making the transition to higher education (if desired) more attainable for vocational students.[12] Students at this level make a choice between five general education study programmes, and eight VET training programmes (Table 1).

Within upper secondary school, there are several tracks of VET that combine different proportions of school-based learning and work-based experience through apprenticeship (Figure 4).[13] According to this paradigm, the study of building and construction is considered separately from design, arts and crafts. In 2017, 43% of learners entering upper secondary school chose a VET programme.[14]

VET programme	No. of available trade and journeyman's certificates	Per cent of total number of VET learners
Building and construction	23	12.2
Design, arts and crafts	49	5.7
Electrical trades	21	15.3
Health care, childhood and early youth development	8	28
Agriculture, fishing and forestry	8	6.4
Restaurant and food processing trades	12	5.1
Service and transport	8	11.5
Technical and industrial production	65	15.8
Total	194	100

Table 1: Distribution of participation and numbers of different certificates available within Norwegian upper secondary VET programmes.[15]

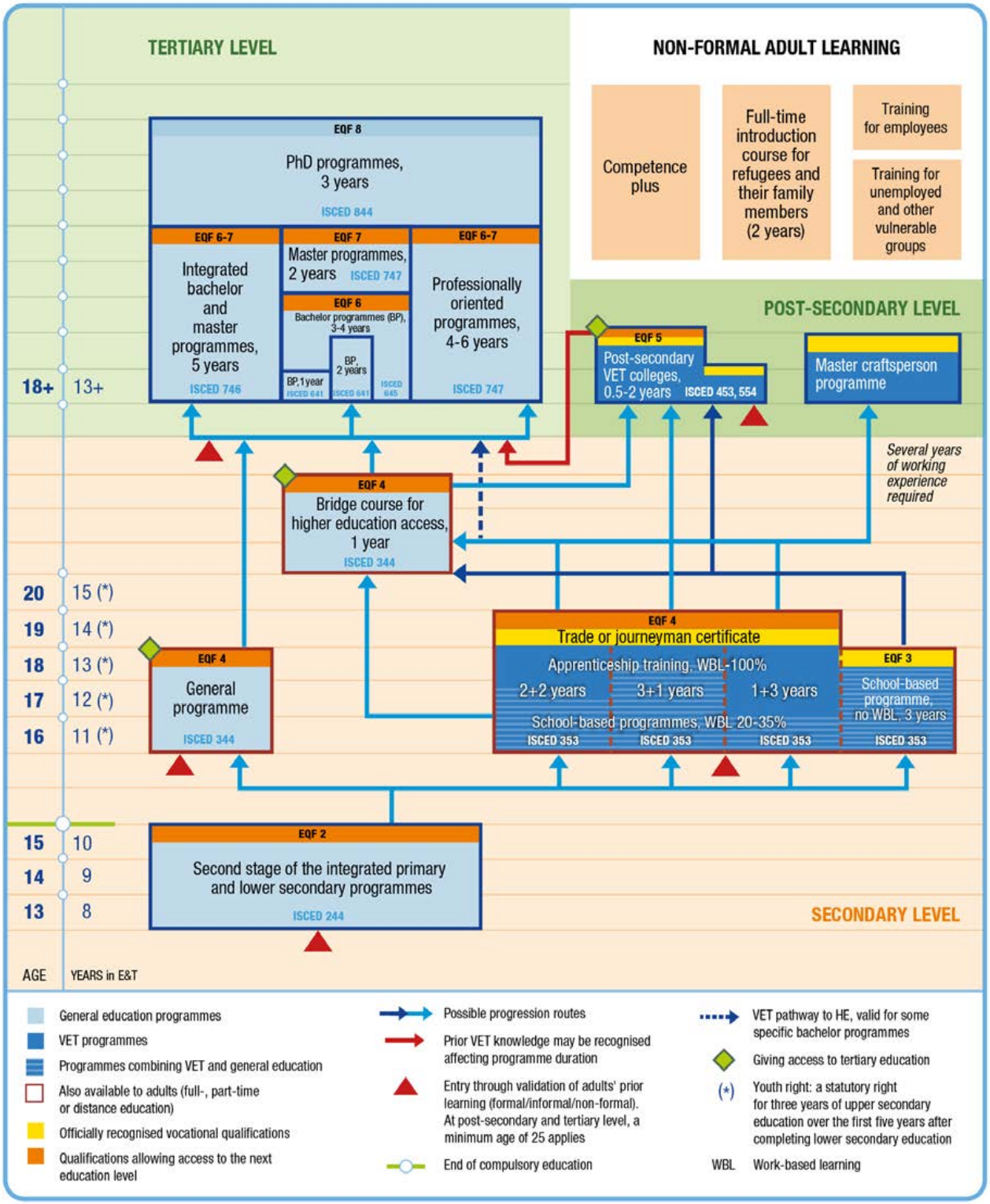

Fig. 4: Chart of Norway's education and training system. Source: Cedefop and ReferNet Norway.[16]

APPRENTICESHIP SYSTEM

The apprenticeship system in Norway is fully integrated into the upper secondary schools, and is considered a form of tertiary education.[17] Different disciplines and training programmes involve differing proportions of time spent learning in school, and time spent acquiring workplace experience through an employed-status apprenticeship. The 2+2 model (two years school-based learning, plus two years of apprenticed working) is the most commonly followed, but 3+1, 1+3, and 3 years school-only are also possible (Figure 4). The 2+2 is followed by a trade or journeyman's test leading to an European Qualifications Framework (EQF) 4 qualification and a trade certificate.[18]

Within the 2+2 model, the first year of in-school education has a broad scope, incorporating a programme of general studies (English, Norwegian, mathematics, etc.), along with a general introduction to vocational working. Schools liaise with local employers to arrange opportunities for students to spend time in the workplace, often in many different vocations, giving them the option to try more than one trade. Students make their choice of vocation when entering the second year of upper secondary education.

Although most (72%) of vocations operate according to either the 2+2 or 3+0 models, some more rare or specialised trades, particularly among crafts, operate according to alternatives, such as the 1+3 model. Traditional crafts such as masonry, gilding, engraving, locksmithing and ropemaking use the 1+3 model, as the numbers undertaking these crafts are considered too small to build a second year of schooling, during which the training is expected to become more specific to the vocation.

Once out working at enterprise, the apprentice spends the first year training and acquiring skills, and is expected in the second year to be an earning and productive employee of the company. The salary increases during this period as the apprentice gains skills, rising from 30% to 80% of a fully qualified worker's. Training enterprises are given grants to incentivise taking on apprentices, and further grants are available for rare or endangered crafts. The training enterprise is required to appoint a training supervisor and one or more trainers, who must be suitably qualified to carry out training, though this may be through formal qualification, or through demonstrable skill or length of experience in the trade. They need not hold a teaching certificate or educational qualification.

Although apprenticeship is the most common route into vocational qualification, it is also possible for candidates to take the qualifying examination without going through formal training. They must be able to demonstrate competence in the exam, and must have practical working experience equivalent to the length of an apprenticeship plus 25%.

FURTHER EDUCATION

Students who successfully complete upper secondary also have the option to take a year's bridge course which can lead to higher education, or they can continue onto tertiary education at a technical vocational college (fagskole). With reference to construction, the offerings at the college level are related to construction management and environmental design, and do not further specialise in any crafts.[19]

SUPPORT FRAMEWORKS

All education – primary, lower and upper secondary, and VET including apprenticeships – falls under the Education Act of 1998, most recently updated in 2018. The Act gives the Ministry of Education and Research (Kunnskapsdepartementet) responsibility for developing national policy and for administering education and training at all levels. Responsibility for developing plans and financing is then devolved to counties and municipalities.[20] In line with the 1998 Education Act, sector and social partners have representation – often in the majority – on all important advisory bodies for upper secondary VET: National Council for Vocational

Education and Training (Samarbeidsrådet for yrkesopplæring (SRY)), eight vocational training councils (Faglige råd), the County Vocational Training Board (Yrkesopplæringsnemnda), trade-specific examination boards (Prøvenemnder), and national appeals boards (Klagenemnder), to name a few major partners.

The Directorate of Education designs programmes at the upper secondary level, and these must be recognised by NOKUT. NOKUT is also responsible for the recognition, accreditation and quality assurance in post-secondary upper education. Each of the eight upper secondary VET programmes is monitored closely by its own trade-specific vocational training council, who input continuous tweaks and changes based on input and feedback from social partners or county authorities. The vocational training council must compile a report every four years covering recommendations and needs for change. A county vocational training board (Yrkesopplæringsnemnda) for each county gives advice on quality, career guidance, regional development and the provision in the county to meet local labour market needs.

On a higher level, the National Council for Vocational Education and Training (Samarbeidsrådet for yrkesopplæring (SRY)) 'acts as a coordinating body for the sector and as an advisory body to the Ministry of Education and Research.' The Council's main objective is 'to improve cooperation between the colleges, the rest of the education structure, working life, and society in general.' The Council comprises representation from the education sector, employee and employer organisations and learners.

The national Norwegian Directorate for Education and Training engages at a higher level with both the National Council for Vocational Education and Training, and also the vocational training councils, and holds the secretariat for both. It is this national Norwegian Directorate for Education and Training that is responsible for continuous curricular development, setting up a tripartite working group to execute whenever a need for a new qualification is identified (by the vocational training councils). This group charged with developing the new qualification is comprised of professionals appointed/suggested by the employer/employee organisations and VET teachers, with external support from the sector, who help quality assure the curriculum before it is finally signed off and set by the Ministry or Directorate for Education and Training.

The above relationship between employers and enterprise within the sector, and employee associations and labour unions, is the result of a formal agreement ratified in 1976 at session 142 of the Human Resources Development Convention, that establishes cooperation and participation of sector and social partners by establishing that employer organisations and trade unions 'shall influence and participate in laying the framework for and developing vocational guidelines and training'.

Skills Norway (Kompetans Norge) is the Norwegian Agency for Lifelong Learning, providing support to the skills training sector in general, through research and mapping tools that continually monitor the status and needs of skills in all sectors. They also are a subsidy-giving body with a particular focus on adult/lifelong learning and also assimilation support for immigrants.[21]

The above describes the primary structure of how trade qualifications are need-identified, developed, implemented, and assured and monitored for continued quality and relevance. The network of sector associations, labour unions and other steering or interest groups is complex. Below is a summary of some of the major contributors to the construction training sector.

The Confederation of Norwegian Business and Industry (NHO) is a large employer's organisation which was formed in 1998 as a merger of major industry organisations, among which was the Federation of Norwegian Craftsmen.

The Norwegian Confederation of Trade Unions (LO), together with the NHO, have a basic agreement governing things such as validation mechanisms in enterprises and documenting workers' competencies.

The Norwegian Association for Adult Learning (NAAL) is the national non-governmental umbrella charity for adult learning in Norway, comprised of 14 government-approved sector-specific adult education associations.[22]

The Federation of Norwegian Construction Industries is the third largest association in the Confederation of Norwegian Business and Industry (NHO), with 15 different construction industries represented under its umbrella.[23]

The Norwegian Folk Art and Craft Association is an NGO that has been promoting the interests of traditional crafts through market support and training since 1910.[24] In a similar vein, the Norwegian Crafts Institute provides business and network support for rare crafts such as blacksmithing, leaded glazing, boatbuilding, wood carving, and decorative plasterwork, organising training courses and in particular assisting with putting together opportunities for apprenticeship.[25]

ENGAGEMENT WITH INDUSTRY

Formal engagement with industry is integrated into the core of construction crafts training in Norway. In addition to serving advisory and steering roles at the higher sector support levels outlined above, time spent in 'enterprise' – as it is called – is part of almost all VET education at the upper secondary level. Not all training trajectories finish off with an apprenticeship, but apprenticeship is the norm and the encouraged route, putting the pressure on schools and training bodies to work with industry to find placements for every candidate.[26] A secondment programme exists whereby industry trainers and in-school VET teachers can spend time working in the alternative environment, enhancing mutual cooperation and communication, and ensuring that trainers in schools have a good working knowledge of current working life in that trade.[27]

IN-SECTOR TRAINING AND PROGRESSION

The approach to job satisfaction and the opportunities provided by the Norwegian state create a culture that embraces and supports adult learning, lifelong development and career mobility between industries. As discussed above, organisations like NAAL, and the core emphasis in Skills Norway (Kompetense Norge) on lifelong learning, demonstrate that post-school training is supported by grants and an age/distance accessible infrastructure. In 2017–18, more than half a million learners attended courses at adult education institutions (around 25% of the adult population), and over 10,000 undertaking a distance learning course of some kind. Moreover, the majority of those enrolled in adult education and distance learning were women and over age 30.[28]

As discussed above, the majority of skilled manual workers in the construction industry are under 40. A full-time salaried employee in a construction company earn upwards of NOK 480,000 annually (around PZN 200,000 or GPB 40,000), and experienced self-employed contractors can earn substantially more.[29] The median income in Norway is NKO 290,000 (PLN 122,000 or GPB 24,000), making full-time construction employment attractive from an earning point of view.[30]

There is scope for progression within craft careers in the form of attainment of a Master Craftsman Certificate (mesterbrev), which is intended for existing professional craftspeople who wish to set up their own business or hold managerial positions within a craft enterprise. Candidacy for the certificate requires the trade certificate received upon completion of upper secondary VET, as well as several years

working experience, and the training – usually delivered part-time over two years – focuses on business management, marketing, and craft theory.[31] The programmes available are predominately craft-based, and attainment of the Master Craftsman certificate confers status as a Master Craftsperson.

As indicated by the number of organisations described above that support lifelong learning, Norway has a strong infrastructure to support VET for adults changing careers, or for reintegration into education for those who did not complete normal schooling. Furthermore, apprenticeship is not age restricted, and adults are able to sign apprenticeship employment contracts as part of their training, with specific grants available to enterprises who take on adult apprentices. In addition, there exist two systems of prior learning recognition and experience-based certification, and adults have a statutory right to have their prior learning or acquired experience assessed and quantified.[32] Statistics show that these schemes have significant uptake, with the certificates issued based on prior learning/experience assessment increasing 10% from 2014–2017, and constituting over 1/3 of the trade certificates issued in 2017 (Figure 5). Certification is offered on an incremental basis, with 'competence certificates' issued that can accumulate to achieve a full trade certificate. Adult learning centres offer courses on multiple completion schedules, such as part-time and evening classes, and put special emphasis on distance and e-learning options. The teachers at these centres are drawn from the same pool as those who work with upper secondary VET, so there is no difference in quality of instruction. To facilitate mid-career learning and development, adult learners are entitled to state financial support.

All the above contribute to a culture that encourages lifelong skills development and sees participation in training as an integral role of sector enterprises. 86% of Norwegian enterprises offer training, and 80% of the adult working population participate in training during paid working hours.

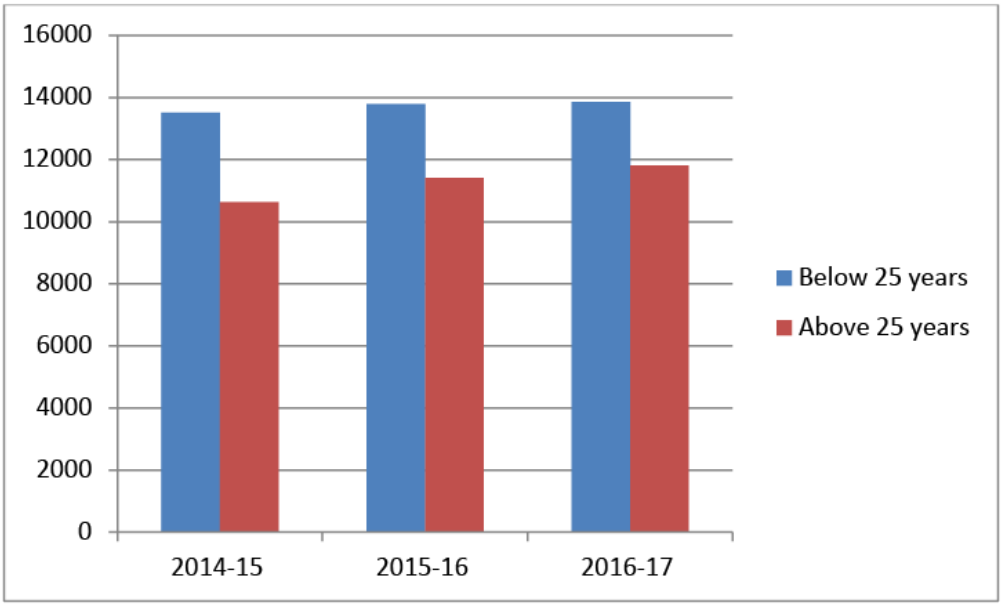

Fig. 5: The number of trade certificates completed by adults is only marginally fewer than those completed by learners below 25.[33]

CASE STUDY

VOSS VIDAREGÅANDE SKULE

The Voss Vidaregåande Skule is a three-year vocational school serving the Voss municipality of Western Norway. Newly founded in 2016, it features attractive, award-winning facilities and serves 400 pupils of the Voss area. With a specialism in construction – among other fields – it trains students from their first year out of general school and prepares them either for the workplace or for university.

In the first year students learn general academic subjects along with general vocational topics, such as health and safety and scaffolding, in which they become qualified after the first year. During the first year, students spend one day per week in work placements with a variety of employers, to inform themselves about different careers. In the second year, students choose their vocation and spend more time working in it, with month-long placements in both the autumn and spring.

In construction, project-based learning is emphasised, and opportunities sought to link the growing skills of the students with the needs of the community. Second-year Voss students hone their skills by completing full scale contract projects for private individuals in the area (Figure 6). It is also in the second year that students can begin to apply for apprenticeships, which are arranged by the local authority in collaboration with local employers. The apprenticeship training lasts for two years, after which the students take their trade exam and earn their diploma.

The Voss school is characterised by local values and active engagement with local employers. The classroom-based construction training emphasises local and vernacular materials and techniques, while the school itself maintains a database of local employers for arranging work placements. Employers are actively encouraged to work with the school, and the market is further rewarded by school investment in local materials and skills. Though perhaps onerous to arrange, the application of students' skills to building actual structures in the local area strengthens the link between the training centre and the local community, promoting useful learning with concrete and ambitious outcomes.

Fig. 6: A traditionally-framed timber structure called a Gapahuk. This structure was a training project built in two weeks by Voss second-year students for a local family.[34]

COUNTRY SUMMARY: POLAND

SECTOR OVERVIEW

Unusually for the EU, the construction sector in Poland represents a shrinking proportion of its overall GDP, comprising 8% in 2001, and projected to sit around 5% by 2022.[35] Employment statistics further indicate a contraction in the sector, with employment in the narrow construction sector (on-site work) shrinking 20% between 2010 and 2016. Craft and related trades were among the sub-sectors most heavily affected by the decline.[36] In keeping with other EU countries, even despite the contraction of the industry as a whole, the shortage of skilled workers has steadily increased since 2015, with the number of job vacancies increasing 60% between 2013 and 2015. The implication may be that the exit or loss of workers from the industry has left behind a workforce not only reduced in numbers, but also disproportionately weaker in skills. Employers find it particularly difficult to fill roles for skilled manual trades such as bricklayer and plasterer.[37] According to a 2017 report, the most in-demand professions in the construction industry were almost all craft trades: carpenters, roofers, tinsmiths, masons, plasterers, woodworkers, electricians, locksmiths and assemblers/installers.[38]

It has been noted that the primary arenas of craft occupations in Poland are in repair, maintenance, and renovation. Thus one aspect likely affecting the thriving of trades among the construction industry is a simultaneous contraction of around 11% in household spending on renovation and maintenance (though household income has continued to grow steadily), which is the main staple of work for those in traditional craft trades.

One of the strongest contributing factors to the skills erosion and contraction of the industry as a whole is the mass migration of skilled workers, particularly from the construction industry, into other EU countries with higher pay and better working conditions.[39] This migration is well known and documented, and the presence of Polish workers plays a significant role in the dynamics of the construction industry in many EU28 countries, including Norway and the UK.

However, it is more than this haemorrhage of labour that is contributing to stagnation of the Polish construction sector. A lack of investment has been identified, whereby government agendas incentivise and support more 'high-tech' sectors.[40] In the past couple years, steps have been taken to address this, but until very recently construction companies suffered from heavy administrative burden and systematic late payments on public and private contracts alike, coupled with taking on risk within large projects, which under the Polish system is legally relegated to sub-contractors. This has led to increased bankruptcy and insolvency among Polish construction enterprises – almost 50% reporting financial difficulty in 2017 – the vast majority of which are SME's, and consequently high interest rates, resulting in overall stagnation.[41]

As can be expected, the construction sector in Poland is dominated by self-employed and SMEs, with a few larger players. Following on from the issues described above, in particular the vulnerability of small firms, the government have taken measures to boost the competitiveness of small firms. In 2012 the tendering procedures for large contracts were loosened, allowing small companies to compete. However, this led to a trend of lowball tenders resulting in poor quality, and a new emphasis has been placed on choosing quality over price in public contracts. The government has also incentivised registration in Poland's Central Register and Information on Economic Activity (CEIDG – Centralna Ewidencja I Informacja o Dzialnosci Gospodarczej), by lessening penalties for mistakes or faulty work and, astonishingly, by creating a shareholding and tax-break structure that explicitly aims to keep craft businesses within families,

identifying that family-inherited businesses are part of Poland's trade culture.[42] It also makes self-employed single person firms subject to the same incorporation requirements as a large firm, thereby supposedly raising the profile and esteem of small scale practitioners.[43]

As with all countries, the construction industry in Poland is disproportionately male, with women comprising 8% of the industry. This is higher than female participation in other countries, but construction and craft trades still represent the lowest female participation of any industry in Poland.[44] Educationally, women are most likely to fall into the category of 'NEET', i.e. not participating in employment, education or training, while simultaneously women in Poland are more likely to have progressed to higher and tertiary education than men, and correspondingly less likely to enter VET.[45]

VET IN SCHOOLS

Recent major reforms within the Polish school system will make it difficult to assess the efficacy of VET in schools.

Primary school in Poland begins at age seven and lasts eight years. The first three years of primary school are handled by a single teacher instructing multiple subjects, while the following five years are split and subject-specific. At the end of primary school, students sit a competence exam which marks the end of compulsory general education, and from this point the upper secondary school prepares students either for the workforce, or for progression to higher education. Preparation for higher education takes place over five years at general secondary school (liceum), after which students take the 'matura' exam for progression to tertiary education. Learners undertaking vocational training have two options from this point. They can either enter the technikum, which is a five year continuous programme in VET, or they can undertake a two-stage sectoral vocational education programme (szkola brazowa).

Stage one of this sectoral vocational school lasts three years, and stage two, if undertaken, lasts a further two years.[46] After this, vocational education at the tertiary level is carried out by post-secondary schools (szkola policealna), where programmes last two and a half years. The subjects taught at the technikum (five-year programme) are more related to commerce and technically specialised trades such as electronics specialist, accountant, salesperson, and agricultural specialist. The subjects taught at the two-stage vocational schools are for less complex occupations, such as floristry, hairdressing, cookery, as well as most of the construction craft trades.

Education in Poland is compulsory up to 18 years of age, though full-time in-school education is only compulsory up to age 15. Between 15–18, education can take place part-time or in short-form qualification courses or vocational training alongside employment.[47]

Major reforms to schooling in Poland have been introduced as recently as 2016, and are still being rolled out into 2021. In addition to lengthening the duration of studies by one year both for general studies and for VET, some major emphases of the new reforms are as follows:

a. Strengthening cooperation between schools and employers.
b. Regular forecasting of demand for employees in vocational occupations.
c. Changes and improvements to vocational examinations.
d. Making in-company training for VET teachers compulsory.
e. Streamlining processes for introducing new qualifications.
f. Increased subsidies for local governments for VET.[48]

Crucially, the new reforms have lowered by one year the age at which students begin to choose their vocational pathway, commencing at age 15 following the junior high school leaving certificate. Also integral to the new reforms is a new way of classifying occupations. Occupations are now classified according to how many qualifications they require, which amounts roughly to the complexity of the occupation. For instance, a very uncomplicated vocation may require only one kind of qualification to certify competence, while more complex vocation might require two or three qualifications. In the stage one and stage two sectoral vocational school route, candidates who successfully complete stage one will leave with a diploma for a single-qualification occupation. If the occupation they aspire to requires further qualifications, they will progress to stage two, and then possibly even further onto the post-secondary school, all depending how much VET is required for their desired occupation.

All the vocational programmes described above combine school-based and work-based learning, with the amount of work-based learning up to the discretion of the school. However, a minimum proportion of 50% work-based learning is nationally required. However, a report by the European Centre for the Development of Vocational Training (CEDEFOP) shows that 'work-based learning' can also take place at the schools themselves, in workshops or laboratories, meaning that the actual engagement between learners and the real workplace may be quite low.[49]

APPRENTICESHIP SYSTEM

Apprenticeship in Poland is formally constituted in the contract between an employer and a juvenile worker or learner, making the relationship with the employer – rather than with the educational facility – the primary relationship.[50] The normal course of an apprenticeship comprises a combination of work-based training or experience, with theoretical education taking place either at the stage one sectoral school, or independently through individual courses. The proportion usually amounts to two days of theoretical training per week, and three days working. Apprenticeships last no more than 36 months, and are concluded with a state vocational examination or a journeyman's examination.

Apprenticeship employment is supported by the State Labour Fund, and some funding is directly contingent upon successfully passing the final examination, incentivising quality training by the employer. By law, the contract must dictate the terms of the apprenticeship, such as start and end dates, obligations of both parties and also the scope and form of the training to be provided. In Poland, an apprentice is an employee first and a student second, and it is the employer's role to direct the apprentice toward theoretical education at schools or other courses, rather than the school's responsibility to arrange apprenticeship placements.

By far the largest sector training apprentices in this way are the construction craft trades, which employ 80% of all apprentices in Poland.[51]

There are official age restrictions for apprenticeship, stipulating that learners be between 15 and 18 years old, in other words, that they be officially considered a 'juvenile worker.' However, the recent educational reforms have angled apprenticeships more toward lifelong learning, and have put in place educational programmes for unemployed adults, which last 6–12 months and finish with the journeyman's exam.

Although the relationship with the educational body is secondary in Polish apprenticeships, in practice almost all apprentices (95%) are enrolled in formal secondary education and have dual status of a student and a juvenile worker.[52]

SUPPORT FRAMEWORKS

VET in Poland has three governance levels: national (ministries), regional, and county (powiat). Counties have responsibility for upper secondary schools, where most VET takes place. Regional entities (wojewodztwa) engage with social partners who advise policy on larger agglomerates of schools or training centres that may address regional skills needs. At the national level, the Ministry of Science and Higher Education is responsible for VET at the higher levels.

This hierarchy also comes with a trickle-down of funds, in which the government supply funding to the regional and municipality bodies for educational spending, though the exact manner of spend is discretionary, and the regional bodies in turn allocate funds to the county level. Analyses show that the regional and municipalities spend more than their allotted subsidy on education, while counties – which have the most direct role in VET – do not spend their entire subsidy on education, but rather reallocate a portion of it elsewhere. In 2017, public spending on vocational education was 10% of the total spend on education.

A system of sector skills councils was launched as recently as 2016, and is still in process of refinement. The sector skills councils are managed by the Polish Agency for Enterprise Development (PARP), which consists of representatives of the ministries of economic development, education, higher education and science, training institutions, labour market stakeholders, as well as representatives of social partners, universities and non-governmental agencies. The main task of the PARP is to encourage the development of sector councils, including the involvement of relevant sectoral stakeholders. The main aims of the sector skills councils are:

a. to collect information from various labour market stakeholders and recommend systemic solutions and changes in the area of education.
b. to stimulate cooperation between education providers and employers.
c. to provide support in identifying and anticipating competency needs in a given sector.

As part of the three-stage total reform of the Polish education system, including vocational training, the Education Development Centre and the Education Ministry evaluated the relevance and usefulness of existing qualifications and occupational pathways. Between 2016–2018, a Social Partners Forum comprising stakeholders from across VET sectors reviewed the current offering, and proposed and implemented 60 new curricula for VET, 58 of which were modernisations for older occupations (a large proportion of which were craft trades).[53]

Quality in VET schools is externally assured by the Regional Education Authorities, regional bodies overseen by the Ministry of Education. The review and production of quality standards for training and assessment in VET is the remit of the National Centre for Supporting Vocational and Continuing Education (KOWEZiU), an agency likewise supervised by the Ministry of Education. KOWEZiU was the main consulting body in reviewing vocational qualifications as part of the 2016 educational reform.

The above has summarised the administration and regulation of VET at the national and local level, as well as the basic thrust of the large scale educational reform recently implemented, and how this comes to bear on vocational education. The network of sector associations, labour unions and other steering or interest groups is complex. Below is a summary of some of the major contributors to the construction training sector.

In Poland, there is also a strong culture of schools organised by non-governmental organisations, such as religious bodies or social associations.[54] At the lower and upper secondary levels, only around 10% of learners in VET are attending non-state educational institutions. However, at the post-secondary level the proportion flips, with over 85% of post-secondary VET activity undertaken at non-state educational facilities.

A particularly important role is played by the Polish Craft Association (Związek Rzemiosla Polskiego), which is an umbrella organisation comprising craft chambers and guilds. The Polish Craft Association supervises the apprenticeship processes and the development of examination standards for journeyman and craft master titles with regard to craft apprenticeships. The Polish Craft Association, along with the Labour Fund, also reimburses employers the cost of training apprentices. The Polish Craft Association also has a dedicated fund, the "Educational Fund" (Fundusz Oświatowy ZRP), which supports promotional spots, publications and articles that promote apprenticeship. It also particularly looks after the interests of SMEs, which make up the vast majority of craft enterprises.[55]

The National Voluntary Labour Corps is a non-governmental public body whose main goal is to support the social and professional development of youth by providing volunteer working opportunities to vulnerable groups and youth at risk of social disengagement and unemployment.[56] Around 800,000 young people are trained every year in 60 different professions, many of which are construction crafts.

The National Training Fund (Krajowy Fundusz Szkoleniowy) aims to counter layoffs and promote a culture of professional development by allowing employers to apply for financial support. It plays a key role among vocational sectors generally, particularly as most employers who deliver training or employ apprentices indicate that they are not sufficiently compensated to offset the loss of time spent, and the relative lack of skill of trainees.

The Labour Fund promotes participation by granting resources for vocational training initiatives, reimbursing employers who take on trainees, from a fund to which employers are statutorily required to contribute.

The Polish Association of Construction Industry Employers (Polski Zwiazek Pracodawcow Budownictwa) is the largest trade association for the construction industry, and represents over 80 companies, most of them large firms executing public contracts. It is the primary influential body, advising the Polish Seym (senate) on sector needs and issues, and also a main partner for directing and organising vocational training through schools and through special EU initiatives.[57]

ENGAGEMENT WITH INDUSTRY

As described above, training in construction crafts would not be possible without industry engagement. This is especially true for apprenticeships, which rely on the initiative of the employer to signpost apprentices toward appropriate theoretical training. It is difficult to accurately gauge the extent or quality of engagement with industry in VET. As seen above, although training in secondary schools requires that around half of school time be work-based learning, this can include time spent in artificial environments such as workshops, so does not actually guarantee any significant portion of time spent in the workplace, being equipped for the world of work. Likewise the leading role in training played by the Polish Association of Construction Industry Employers is perhaps also fraught, as this organisation mostly represents the interests of large, powerful firms, rather than the SMEs who are the norm in industry.

However, the aims of the educational reforms make it clear that increasing and improving the engagement with industry in VET training is a top priority. In addition to generally strengthening partnerships between education providers and employers, the new reforms also make real workplace training mandatory for VET teachers in schools, which can only improve the quality of teaching, and increase its relevance to actual working life.

IN-SECTOR TRAINING AND PROGRESSION

The landscape of continuing vocational education and training (CVET) in Poland reflects a slowly increasing recognition of the importance of lifelong learning opportunities, but also a low and stagnant participation rate in adult training. The pathways to upskilling as an adult are mostly vocation-specific and consist of acquiring a particular skill for an existing job in ongoing employment. Adult trainees can apply for assistance in financing their further training, but the norm is for financing or co-financing with their employer, and public funds for later-life training are called upon only 15% of the time.[58]

However, training is much more common for employees of large companies. Employers are required to give leave for self-development in specific circumstances, but these are relatively narrow, and mostly consist in up to six days of leave for the specific purpose of taking an examination, such as the State Vocational Examination. The norm, therefore, is for training without statutory leave, which must rely on the goodwill and agreement between employer and employee in terms of the type, necessity, cost and length of the training.

In reality, participation in training undertaken by adults outwith normal youth education is very low – only around 5% – well below the EU average of 11% and, as we have seen, over 30% in some EU countries.[59] The traditional model dominates of undertaking education in youth in preparation for a specific occupation, and considering it complete upon the achievement of a qualification. The most commonly cited reason for not undertaking further training is that it is simply not necessary.

A further contributing factor is the fragmentary and ad hoc nature of the training market. Although there is a database of development services (Baza Usług Rozwojowych) that exists to make information on available training offer accessible, in reality the training landscape is fragmented and dominated by small companies (86%) that come and go frequently, and this short duration may imply that the experience of trainers is short lived, and thus the quality of their training unreliable.[60]

The state VET system does provide pathways for attainment and validation of learning for adults who never completed regular school. The state vocational examinations are open to anyone who can demonstrate a certain length of work experience. There are also adult education schools (Kwalifikacyjne Kursy Zawodowe – KKZ) that provide vocational qualifications under a funded system depending on eligibility, with an emphasis toward unemployed adults.[61]

COUNTRY SUMMARY: SCOTLAND

SECTOR OVERVIEW

The construction sector in Scotland is one of the largest and fastest growing industries, employing 8% of the total workforce as Scotland's second largest employer.[62] Within the general construction sector, repair and maintenance is a large and important sub-specialty, comprising over 35% of construction activity and predicted at 2015 to grow at a faster rate than new-build construction.[63] Despite the large ongoing need for repair and maintenance skills, which are generally grounded in traditional construction crafts, training in construction in Scotland is centred around new-build, and tends to see repair and maintenance as disproportionately niche and specialised in spite of its large share of sector gross value added (GVA).[64]

The implications of a lag in repair and maintenance skills, which are arguably more labour intensive and more highly skilled than new-build construction requires, corresponds to a general shortage of skills noted by the construction industry at large (Table 2).[65] Employers who found it hard to fill skilled positions overwhelmingly cited that applicants were not sufficiently skilled, or not sufficiently qualified for the positions. The secondary reasons surrounded attitude problems, or lack of motivation or work experience, seeming to indicate that even those who come through to the workforce with skills and/or qualifications, are not necessarily prepared for the world of work in general.

With regard to particular trades, stonemasons, plasterers, lead workers and traditional joiners have been noted as in especially short supply. And for the UK in general, joiners also topped the list of hard-to-find traditional trades, alongside floor layers and painters/decorators (drawing from the range of traditional skills).[66] Research undertaken by Historic Environment Scotland (HES) in the last decade identified traditional trades that are endangered through lack of demand, lack of practitioners and/or lack of training pathways, including thatching, earth building, boat building, blacksmithing, foundry work and drystone dyking (Table 3).[67]

Causes	Per cent
Applicants lack the skills we require.	84%
Not enough people being trained in the construction trades in recent years.	81%
Applicants lack the motivation / attitude we look for.	74%
Applicants lack the work experience we look for.	68%
Low number of applicants generally.	53%
Applicants lack the qualifications we look for.	51%
Competition from other employers.	39%
Bad location / unappealing work environment (spontaneous).	7%
They are demanding too much money (spontaneous).	4%

Table 2: The most commonly cited difficulties among construction operatives stem from a lack of skills. Source: Construction Skills, *Skills and training in the Construction Industry* (2009).

Skill / trade	Apprenticeship route (to SVQ L3): % not covered	% covered by one or more qualification	% partially covered by one or more qualifications	Route notes
Brickwork	40	55	15	
Carpentry and joinery	13	90	7	
Drystane dyking	No apprenticeship exists	100	-	
External work	No apprenticeship exists	86	14	Seven different landscaping qualifications make up these statistics.
Earth clay and turf	No apprenticeship exists	0	0	
Energy efficiency	No apprenticeship exists	17	18	
Flag floors	No apprenticeship exists	44	11	
Glazing	14	79	7	
Graveyards	18	71	12	
Metal roofing	41	70	12	Roofing
Metal roofing	23	70	12	Plumbing
Traditional metalworking - blacksmithing	No apprenticeship exists	0	0	Heritage blacksmithing NOS in development at time of writing.
Traditional metalworking / wrought iron production	No apprenticeship exists	0	0	
Traditional metalworking / iron founding	No apprenticeship exists	0	0	
Painting and decoration	38	78	9	
Pattern-making	No apprenticeship exists	0	0	
Plastering	45	64	10	
Roofing	32	88	2	
Stained / leaded glass	-	-	-	
Thatching	17	65	17	
Wall and floor tiling	25	75	17	Wall and floor tiling qualifications.

Table 3: Overview of skills covered by more one or more qualification. Most of the traditional crafts that make up the repair and maintenance sector and are essential to the conservation of historic buildings, have fragmentary or non-existent training pathways.

* This relates to LANTRA Cert - not delivered by Scottish colleges.

Scotland performs well in terms of construction qualification attainment, with the highest percentage of attainment at the top level of all the home countries, as well as the second lowest percentage of construction workers holding no qualifications (Table 4).[68]

Geography in Scotland continues to play a role in the accessibility of skills and skills training, with most resources concentrated in the central belt, and only a handful of college hubs in the highlands, islands, and the more remote areas of Galloway and the Borders, where the offering of construction craft qualifications is likely to be extremely limited. Despite the increase in remote learning and ever-growing appreciation for the need for accessibility, manual occupations require some portion of in-person training, tuition and work experience, meaning that general connectivity is unlikely to fully address the issue. In terms of the availability of skills themselves, the same lack of access prevails, with over half of clients in the highlands reporting waiting over two months for contractors.[69] It is estimated that only around 1000 construction operatives are based in the entire Highlands and Islands region.[70]

The construction industry in Scotland is ageing. Despite efforts to increase recruitment in college courses and increase apprenticeship placements, the average age in construction has moved upward in the last twenty years, perhaps indicating fewer young people entering the sector. One contributing factor here of course may be the influx of construction workers from the EU10 over the last seventeen years, most of whom will arrive as mature, working adults, thereby driving up the average age of the workforce.[71]

The construction industry in Scotland is predominately male, with women comprising 13% of the total sector – a larger proportion than the EU average, but only 2% of manual trades, on par with Poland and Norway at the bottom of the scale. The construction industry is the most gender-imbalanced industry in the UK. This shows little change, and is backed up by apprenticeship starts in 2018/19 for construction crafts, which matched this proportion exactly at 2% female and 98% male.[72] In Scotland, ethnic minorities are represented proportionally at 4%, though they are vastly under-represented in the UK as a whole, making Scotland a leader in this respect.[73]

Qualification	England	Wales	Scotland	Northern Ireland	UK	All industries
S/NVQ Level 4 and above	30%	24%	34%	17%	30%	34%
S/NVQ Level 3	12%	22%	18%	15%	17%	16%
Trade apprenticeships	11%	12%	16%	28%	12%	5%
S/NVQ Level 2	12%	10%	11%	11%	12%	16%
Below S/NVQ Level 2	12%	8%	7%	5%	11%	13%
Other qualifications	10%	11%	6%	6%	9%	8%
No qualifications	8%	12%	9%	18%	9%	8%
	100%	100%	100%	100%	100%	100%

Table 4: Construction industry workforce qualifications vs all industries UK. Source: Office for National Statistics, *Labour Force Survey*. In Scotland, the construction industry is among the most technically qualified, outperforming other industries, and outperforming the construction sectors in the other home countries.

As in Poland, the sector is characterised by a handful of very large firms, and a vast majority of SMEs and sole traders, with over 90% employing fewer than ten people. Although self-employment in construction in Scotland is low (21%) compared to the rest of the UK (England 34%, Wales 37%, NI 41%), however in the craft trades it is higher than the average, at 44% of the craft trades workforce being self-employed. Across the UK, self-employment usually increases in proportion to years served, with very few individuals setting up for themselves without first working for someone else.

VET IN SCHOOLS

The Scottish education system operates according to the Curriculum for Excellence (CfE), implemented in 2014 as part of a major educational reform that sought to make learning more flexible, interdisciplinary and useful.[74] The CfE is divided into two phases: a broad education phase that runs from early childcare up to level S3 (15yo), and the Senior Phase running from levels S4–S6 (16–18yo).

The broad education phase organises curricular programmes around four holistic 'capabilities' aiming to produce capable and well-rounded individuals, with taught academic subjects including science, expressive arts, social studies (history, geography, etc), language and wellbeing.[75] The curriculum area 'Technologies' covers aspects of craft, design, computing, and engineering, and involves basic level learning outcomes relevant to construction, such as the ability to recognise and work with different materials, and the ability to design, draw and construct models.[76] Students are entitled to leave formal school at 16, and there are programmes and support structures in place as part of the CfE to try and transition school leavers into positive destinations.

The three-year senior phase is where attainment of qualifications begins. In contrast to earlier systems which prioritised academic attainment and preparation for higher education, the senior phase seeks to emphasise flexibility and individuality in the learner journey, embracing more engagement with employers, adjustable timescales for achieving qualifications, and the ability to gain more vocational qualifications while still in the school environment.[77]

The qualifications offered at senior phase are National Qualifications, conferred by the Scottish Qualifications Authority (SQA), and include both graded and non-graded courses. Among the non-graded national courses are the Skills For Work, which confer a National 4 or National 5 qualification in a number of subjects, including construction crafts.

Until recently, the Skills For Work programme was the only qualified vocational training available for construction craft. These programmes were recently reviewed by consultation with the education sector, colleges, and employers, and after the success of several pilot trials (see below), have been updated to new National Progression Awards (NPA) qualifications at Levels 4 and 5 in construction craft and technician, and construction skills.[78] These updated qualifications which form part of the Foundation Apprenticeships aim for greater flexibility in delivery, increased opportunity for local employer and college engagement, and ideally centre around a project-based delivery where possible. Their effectiveness is still to be determined, and the logistical challenges of delivery project-based learning are still great, but the recent overhaul does indicate movement in the right direction for developing real workplace and construction skills.

Mathematics and english are compulsory subjects, while the remainder should cover the same curricular areas as the broad general education, offering students an opportunity to deepen their learning. However, the number and kind of further subjects offered depends on the capabilities of the school, most of which are not able to offer a large variety: a 2019 review of the CfE found that 50% of schools offered only four additional subjects, while only 10% offered six. Vocational preparation such as construction crafts falls

within this highly variable offering.[79] The craft offerings fall within the technologies curricular area, and, until the rollout of the new NPA 4 and 5 qualifications, offered a limited range based on three materials – metalworking, woodworking, and plastic (in the area of design and manufacture, and material extrusion). Though this is being corrected by the introduction of new construction qualifications centred on materials like stone and wood, the long legacy of expertise in the design and manufacture realm in the Technologies curriculum means that collaboration with colleges may in many cases be the only way to competently deliver the new content.

For students who have reached the minimum leaving age of 16 and are interested in pursuing a vocational occupation, two primary options are available. They can find and apply for an apprenticeship placement in the craft of their choice, which will involve a block release system of part-time employment and part-time study. Or they can undertake low level progression training at college, which may later lead to an apprenticeship, or to employment at a less skilled level such as general labourer. All craft training programmes at the college and further education level are attached to apprenticeship, and are rarely ever undertaken in isolation.

APPRENTICESHIP SYSTEM

The usual route into employment for construction crafts is apprenticeship. In recent years, the types and subjects offered in apprenticeship have greatly expanded, including Foundation Apprenticeships (which take place within school), Graduate Apprenticeships (which take place in or after university), and Modern Apprenticeships, which are closest to the traditional model and cover the craft trades. Of these, only Modern Apprenticeships cover the craft trades.

Apprentices in Scotland must have employed status, and split their time between the workplace and the classroom/training facility (usually a college) with four days working and one day studying on a block release basis. During the four-year duration, apprentices earn two qualifications: the classroom training qualification (usually an NPA), and the workplace skills-based competency (an SVQ – Scottish Vocational Qualification). The SVQ is a set of competencies that are demonstrated by work undertaken in-enterprise, and are collected for evidencing and assessment in a portfolio of work.

Both qualifications have learning outcomes/competencies underpinned by the National Occupational Standards, which set out standards for competence in a range of defined occupations. The type of work undertaken in the workplace by an apprentice is therefore not largely discretionary: over the course of the apprenticeship, the candidate must provide evidence according to a pre-prescribed checklist of competencies, which is then assessed by an external verifier, without which they cannot achieve the SVQ. The relationship of apprentice to employer has the flavour of a traineeship, since the employer is financially incentivised to produce successful candidates, and thus must have an eye toward making sure the work undertaken is mapped to the qualification.

Government supported efforts by Skills Development Scotland have steadily increased the number of apprenticeship placements made available, rising from 20,000 placements in 2011 to 28,000 in 2019, with by far the largest proportion (22%) in construction trades.[80] Positive feedback from employers indicate that Modern Apprenticeships seem successful and rewarding, namely a good return on investment.[81]

Nevertheless, one of the main obstacles to apprenticeship in construction is the difficulty of finding and arranging placement opportunities. Young people interested in a certain craft do have some agency in approaching and working with employers in their chosen craft to develop an apprenticeship placement, but this requires great initiative on the part of the trainee, and is not well supported by schools or colleges.

In 2011, only 24% of contractors took on apprentices (though this number has now increased somewhat), and because of the prescribed structure and requirement to study (which is usually location-specific), large, well-resourced construction firms offer most of the apprenticeship placements. For traditional building skills and repair and maintenance within the larger construction sector, this is potentially problematic, as it will inevitably skew training, work experience and recruitment toward large companies, whose bread and butter is new construction.

Companies over a certain size pay a compulsory levy to the Construction Industry Training Board, which is invested back into training by helping to fund apprenticeships. Though this has not yet been explored, the fact that most traditional building practitioners are SMEs and sole traders would perhaps highlight a need for ways to make apprenticeship less onerous (in terms of administrative and organisational burden) on small operators. Despite enormous effort to increase placement opportunities, the prospects for someone wishing to undertake an Modern Apprenticeship are highly variable, depending on placements being available in their chosen field, in their part of the country, at a particular time. This can only be a difficult combination to align properly without any regular system of guaranteed distribution of placements across fields, across regions, and recurring regularly.[82]

FURTHER EDUCATION

As described above, the role of further education institutions in VET is an important one, with most vocational training organised at or in association with colleges. It should be noted that, particularly for more niche crafts, small scale specialist training firms continue to play an important role in bridging the gaps left by larger institutions.[83] Further and higher education are fully funded in Scotland for up to four years of full-time study, meaning that candidate places in further education institutions are usually government funded.

Despite their large size and enormous resource, colleges face a number of challenges and obstacles in providing the training needed by the traditional skills sub-sector. College curricula emphasise new-build construction over traditional techniques, feeding into an overall desire to be seen (both by students and by the larger public) as innovative, relevant and attractive. Furthermore, despite a desire and intention to deliver high quality training, achieving those high standards, particularly in the realm of teaching traditional crafts, continues to be impeded by lack of expertise, perhaps underpinned by lack of enthusiasm by the larger institution.[84]

In Willy Roe's incisive review of post-16 vocational education in Scotland, he points out that the funding model of further education in Scotland emphasises quantity over quality, with institutions being incentivised to increase participation, rather than results.[85] Roe also points to a scattered funding model, poorly conveyed and spread across multiple agencies, that stands in the way of coherent engagement with employers and integration of work-based experience in college courses.

SUPPORT FRAMEWORKS

The system of VET in Scotland depends upon the cooperation of many bodies: government agencies, colleges and schools, training providers both public and private, local authorities, employers' and employees' organisations, social enterprises, funding regimes and qualifications authorities. The system within the UK is mostly devolved to the Scottish Government, with some facets reserved to the UK Government (such as Jobcentre Plus) and some aspects cooperatively negotiated among the four nations (such as sector skills councils).

Schools are owned and operated by the local authorities, and are supported in delivery by Education Scotland, an executive government agency reconstituted in 2010, and overseen by the Cabinet Secretary for Education and Skills.

In most instances, qualifications are accredited and awarded by the SQA and owned by the CITB, though the qualification itself may be owned by other public or private entities, such as the English Qualifications and Curriculum Authority, or the City and Guilds Institute. Qualifications in Scotland are mapped onto an integrated Scottish Credits and Qualifications Framework (SCQF), which quantifies the level of different qualifications owned by multiple entities. SQA regularly review the qualifications offering, and play a key role in the development of new qualifications. When new qualifications are developed, SQA provides a roadmap for the process, including identifying the need, consultation with the sector skills council (CITB), sector stakeholders, relevance to the National Occupational Standards and the business case for development and delivery.[86]

The sector skills council for construction in the UK is the CITB, which oversees training standards and engagement with industry, promotes construction careers and training, undertakes regular monitoring of the construction sector and its training needs and functions as a facilitator between enterprise, education and other relevant partners.[87] CITB also acts as a significant funding agent through their levy on construction firms, the funds of which get cycled back into funding apprenticeships, training and development and review of industry training standards.

Public funding for skills development flows from the Scottish Funding Council to the 43 Scottish colleges, and from Skills Development Scotland (SDS), the executive agency for skills. SDS manage a range of responsibilities and initiatives aimed at supporting individuals and training providers, among which are the web portal 'My World of Work,' an important central employment resource, and funding placements for Modern Apprenticeships.

The above has summarised the regulation and delivery of VET at the level of senior phase and further education. The network of sector associations, labour unions and other steering or interest groups is complex. Below are some other major contributors to the construction training sector:

Construction Scotland is the construction sector Industry Leadership Group (ILG) established by Scottish Government to look after the interests of construction as a key growth sector. It plays a leadership role within the industry, fosters cross-partner engagement and cooperation, and has responsibility for developing and implementing the Scottish Construction Industry Strategy.[88]

The Scottish Building Federation is one of the oldest and most influential professional construction associations in Scotland, providing support to its constituent members such as skills training, networking events and learning opportunities, marketing assistance, sector representation and the prestige of association. Once very influential, its role has decreased somewhat in recent years.

The Federation of Master Builders (FMB) is a UK-wide trade association, which explicitly looks after the concerns of SMEs. In addition to representing the interests of its members in a similar vein as the Scottish Building Federation through network benefits, marketing and quality vetting, the FMB also organises the Master Builder Awards, which raise the profile of good craftsmanship, and oversee smaller associated federations, such as the Federation of Master Decorators – Scotland.[89]

HES is a non-departmental public body charged with looking after ancient monuments on behalf of Scottish Ministers, and with promoting and supporting the historic built environment generally. In the context of construction and traditional skills, the promotion, preservation and widening of opportunities in traditional skills training is a priority of HES, which acts as a leading sector partner both in employment and training of traditional craftspeople, and also in advocating for the needs of the historic environment for traditional crafts and repair and maintenance skills.

Developing the Young Workforce (DYW) is a seven-year initiative by the Scottish Government which implements a strategy for making meaningful improvements in the transition from school to employment. Rather than a blanket organisation implementing a single strategy, DYW recognises the need for flexible and situation-specific approaches. Thus, the implementation of DYW has involved installing a DYW representative in schools to support and arrange enrichment opportunities for individual schools with local employers and partners. Almost 100% of schools in Scotland have a dedicated DYW representative.[90]

ENGAGEMENT WITH INDUSTRY

Quality VET in Scotland is impossible without well-integrated engagement with businesses and employers in the VET process. The current landscape of engagement with industry at the school and college level is mixed at best. At the college level, industry's main involvement is in the advisory and steering capacity, influencing the content and delivery of courses through steering groups, industry leadership and advisory groups, and general sector consultancy. The role played by industry in colleges is, therefore, mostly an indirect one, facilitated by the higher-level umbrella organisations and trade associations described above. Most trainers in college have transitioned into being career teachers, with permanent positions at their institutions, and have no continuing or direct relationship with industry, and no requirement or incentive to periodically revisit or re-experience the real workplace.[91] Trainers at college are required to undertake and keep a record of continuous professional development (CPD) training, but in reality this is often of limited value or relevance. The training delivered at the college level is a pre-developed, standardised package, which does not depend on the experience or expertise of the trainer.

The main connection between further education and industry is, of course, apprenticeships, which bridge the gap between time spent in the workplace and time spent in the learning facility. The pre-defined competencies and the requirement for regular check-ins, assessment and verification mean that employers who take on apprentices must necessarily be mindful of their roles as trainers. This perhaps fosters a sense among employers who regularly take on apprentices, that they have a legacy, responsibility and role to play in the pipeline of talent and the fostering of the next generation of their craft. Nevertheless, only about a quarter of contractors actually take on apprentices and the engagement involved.

The greatest opportunity for benefit from engagement between education and employers is at the schools level. In-depth observation from DYW since 2014 has shown that just a single meaningful interaction between a student and an industry employer, overwhelmingly increases the likelihood of that student developing ambitions toward employment, and usually toward the specific sector/career in question.[92] Repeated interactions and long-term relationships are even more powerful. Currently, this interaction is patchy, and dependent upon the capabilities of individual schools and DYW representatives, and the enthusiasm/availability of local employers.

IN-SECTOR TRAINING AND PROGRESSION

While employees in Scotland are in general more likely to participate in training than the UK as a whole, the construction sector in Scotland is one of the least likely to undergo mid-career training, lagging behind the UK and Scottish averages.[93] Training and CPD are also heavily skewed toward larger construction firms,

with 92% of employees at large firms undertaking some form of training annually. Among sole traders and very small enterprises – who comprise most of the repair, maintenance and traditional craft activity – fewer than a quarter undertake any training after beginning work.[94] Large employers are also more likely to train or to make provision for training leading to qualification, rather than one-off or unaccredited training. The greater training participation in larger firms is reinforced by entitlement to CPD and training privileges as contributors to the CITB levy. The most common reason (75% of respondents) for not undertaking training or providing training for staff is that it was not necessary. Employers and potential trainees also indicated that the training provision did not suit logistically, with mismatched timing patterns and locations making it difficult to leave work.

In the realm of traditional and repair and maintenance skills, upskilling can be niche and specific, meaning that the more accessible offerings at large institutions like colleges are unlikely to match the content desired or required. Training and CPD in this sub-sector rely on small scale firms and specialists, who often deliver training alongside actively working. Although this training is likely to be of good quality, it is also rarely accredited or able to contribute toward qualification. It also rarely includes the certification of a skills card – the Construction Skills Certification Scheme (CSCS) card – which combines construction skills with health and safety training, and is a requirement of legally working on any construction site in the UK, i.e. is a prerequisite for employment.

With increasing recognition that pathways into careers may take many routes, and that formal education should not be the end of learning, building in flexibility into VET has been a key priority in recent years. SDS maintain individual training accounts for eligible learners that provide a small sum (£200) annually toward training opportunities. While helpful, a system more integrated with mainstream education would further break down the distinction between education as something that takes place in youth, and professional upskilling and development, which is often not considered necessary, even by the individuals or employers who would benefit from it.

CASE STUDY

ST MODAN'S HIGH SCHOOL

In 2018, Historic Environment Scotland piloted the delivery of a new training programme and qualification at St Modan's High School.

After reviewing the opportunities currently in place in the school curriculum for exposure to construction crafts – the Skills for Work National 4 and 5 in construction crafts offered in the senior phase – it was assessed that earlier exposure and more meaningful project-based learning would be beneficial in preparing students for careers in construction. Furthermore, more engagement with real employers was identified as beneficial.

A new qualification was developed – National 4 construction craft technician – and delivered in partnership with HES (taking the role of a local employer) for a small class of 15-16-year-olds. The intention of the project was to trial and assess the usefulness of the new qualification, and also to work out how partnership between schools and employers could work in the context of a real construction project.

Over the course of the year-long delivery, students received training in traditional construction crafts, and then put their skills to work designing and then constructing a timber-framed bicycle shed with masonry foundations. After the initial pilot in Stirling in 2018, the programme was expanded the following year to further schools in Stirling, Angus and elsewhere in Scotland. The new qualifications (described above) at Level 4 and 5 have now been offered as a core part of the Foundation Apprenticeship across Scotland..

Figures 7 and 8: Students work together with skilled HES crafts people to construct a timber-framed bicycle shed with masonry foundations.

COMPARISONS

EFFECT OF MIGRATION ON CONSTRUCTION INDUSTRY

Each of the three countries have been affected by migration of construction workers in different ways. Poland has seen the construction sector contract significantly since 2004, losing many of its most skilled workers as they've migrated elsewhere. In some ways, Norway and Scotland have seen the benefits of this, as destinations for these workers. However, the effect has been complex, simultaneously creating a more mature and arguably more skilled workforce, but also increasing competition against relatively unskilled or inexperienced young workers entering the workforce out of apprenticeships and perhaps making the sector less attractive.

CULTURAL STATUS OF CRAFTSPEOPLE

In the last few decades, Europe in general has experienced an explosion of interest in university education, with more students than ever choosing to pursue a degree rather than a trade. Culture in some countries, such as the UK, has shifted to view university education and the jobs that follow, as more prestigious and attractive than practical vocations and the skills they involve. Rather than being valued in their own right culturally as well as economically, vocational work and education has come to be seen as a lesser alternative. This has contributed to a situation in which, despite a clear and demonstrable need of skills for a growing repair and maintenance sector, such trades struggle to recruit skilled candidates through the education system.

Poland too has experienced this stigma, which has manifested itself in great government investment for prestigious, high-tech industries, matching a national agenda of 'catching up' with the rest of Europe, and implicitly lowering the prestige of manual trades. Though increasingly recognised as a problem to address, this legacy of poor investment and support for construction trades has real consequences in terms of the volatility and high risk faced by firms, especially SMEs, which makes them proportionally conservative and less willing to engage non profit-making activities like training staff, or devoting time to engage with schools. In contrast, craftspeople enjoy greater cultural prestige in Norway, making the profession attractive. Trades in general are highly regarded and often sought as professions, with more than half of Norway's upper secondary students enrolled in VET rather than academic programmes.

GEOGRAPHY AND ACCESSIBILITY

Many European countries over the last few generations have experienced a concentration of population in the cities, which draw people away from the countryside with greater opportunities for education, entrepreneurship and employment, which then enhance the prosperous urban environment and further the cycle. Some of the negative effects of this trend have been recognised in recent decades, particularly in countries with difficult geography – such as Scotland and Norway – and enormous efforts made to increase investment in rural infrastructure and economies, as well as opening up access to richer urban resources through remote learning programmes and satellite college campuses. Unlike many countries, Norway has largely preserved its rural society, with a population that is much more evenly distributed between rural and urban areas. This affects all areas of life, meaning that rural areas have more vibrant economies, more business enterprises, larger populations and schools that receive investment proportionate to their larger size.

Scotland cannot, at the present time, claim the same, with few construction operatives serving vast areas, and rural communities often dependent upon just a handful of enterprises for local employment, making

them vulnerable if these fail. In addition, there is a direct relationship between the presence of enterprise, and the provision of education in certain areas. Regions where the local college does not offer training in a particular trade, tend to have very little presence of firms working in that same trade. For example, Dundee and Angus College offers no courses in stonemasonry, and correspondingly there are almost no stonemasons operating locally in the entire region, despite the fact that Dundee and Angus have the same high proportion of stone built buildings as the rest of the country. The region is served by stonemasons travelling in from elsewhere. Without a training pathway in a local area, there is no pipeline of talent to become employed in that area, and vice versa: college-based training requires an apprenticeship, which requires local enterprise. If this is not present, there is little point in offering a college course.

Education Scotland, SDS, and the CITB can take a more proactive role in overcoming some of these chicken-and-egg issues: targeted investment and funded partnership can get the ball rolling, as well as finding accessible solutions to the perpetual problem of training being locally restricted by requiring bodies in classrooms, and bodies in the workplace. If these two are not conveniently located, at the present moment no solution exists to overcome this physical, geographical limitation.

VET IN SCHOOLS AND PREPARATION FOR WORK

In all three countries, apprenticeship is the normal route into a career in construction crafts, but there are crucial differences among the three systems that affect their effectiveness in preparing a capable workforce. A crucial distinction is the way in which the education system transitions learners from general secondary school into more specialised vocational preparation.

In Scotland and Poland, there is a clear break between the end of general education, and the commencement of VET. In Scotland, full-time school education is still geared toward intellectual subjects and the preparation for university, and while students in the senior phase can get exposure to construction and crafts (if the school happens to offer them), they cannot undertake meaningful qualifications in any of these subjects while still at school. Only recently, with the revision of the under-serving Skills for Works programmes, into more flexible, project-focused Level 4 and 5 NPAs has the route been opened to school-based qualifications that engage with employers and colleges, offer meaningful project-based work, and are overly structured toward progressing a pipeline of talent into construction careers. These commenced in 2020, and their effectiveness is still to be demonstrated.

In Poland, those on a VET track go straight out into the workforce at 16. The onus is on these young workers to navigate and arrange a system of continuing education for themselves. In both Poland and Scotland, the educational reform emphasis on ‘workplace learning’ can be misleading, as the ‘practical working experience’ can be done in school/college workshops, rather than requiring to be gained in enterprise.

Norway, in contrast, keeps VET learners within the education system, providing an introductory year during which they are students first and foremost, and are given time and opportunities to better understand the landscape of VET and what path might suit them best. The transition to working is done deliberately but gradually, emphasising real work experience, potential employer relationships, and keeping the learners within the structure of the education system. This more gradual, hand-held path must reduce the risk of students disengaging and leaving, and also arm students with meaningful skills by gaining basic general qualifications and workplace experience in the first year, and by putting them on work placements rather than into simulated workshop environments. It also puts responsibility on the state to find appropriate training pathways and apprenticeship placements through employer partnership, rather than requiring the same initiative of 16-year-olds.

The Scottish system undoubtedly suffers under the difficulty of arranging apprenticeship placements, with less than a quarter of working firms ever taking on apprentices. Because of the administrative burdens, geographical restrictions and labour cost of doing so, most apprentices are employed by large, new-build firms, rather than the SMEs who make up the bulk of traditional practitioners. If schools, through the DYW initiative, were able to create meaningful interaction between students and employers at the senior phase, it would increase students' awareness of opportunities in the area, and boost the confidence of employers in taking on apprentices.

Although there is little chance of restructuring the entire Scottish school system, the lesson of helping students explore their options and navigate their career paths while still benefitting from the nurture and support of the full-time school environment can be achieved by introducing more meaningful and earlier VET experiences into the school curriculum. Introducing qualifications that engage students with actual local employers, and that put their emerging skills to work on challenging, meaningful projects, would be a significant step forward in giving vocational students the skills they need both to progress their own education, and to succeed in the future workplace. Qualifications that mean more and begin earlier could also go far toward raising the profile of VET in schools, reaffirming it as an equivalent legitimate pathway, rather than a secondary alternative for students who can't do better.

The fact remains, of course, that practical learning is difficult and more complicated to deliver than lecture-based academic subjects, and that establishing and maintaining relationships with local employers is labour intensive. Either way, more support to schools would be necessary to accomplish the above. The investment of DYW representatives has been a first and crucial step in this direction, and as the programme matures its benefits will accumulate. Furthermore, resource can be redirected away from building expensive state of the art workplace simulations within schools, and reallocated to the human-led task of getting students into the workplace – which doesn't need any further effort or investment to simulate.

PROTECTION FOR RARE CRAFTS

In Scotland the drive to protect and resurrect training pathways in the rarer traditional skills has come from special interest groups like HES, who take on this responsibility as part of the overall remit for protecting heritage. Further education institutions in Scotland, as well as the main qualifications awarding body, are in a numbers game, receiving funding only in relation to the number of candidates enrolled, and qualifications that enrol fewer than 50 per year (an unattainable number for most craft skills) are considered low performers.

Contrastingly Norway is a leader in supporting rare crafts. Norwegian VET schools work individually to develop flexible and bespoke pathways for learners interested in pursuing small-volume vocations, and employers have access to special funding for taking on apprentices in rare or endangered skills. Norway also has regular review of qualification provision built into its educational system and sector skills councils.

Poland also recently reviewed and expanded its offering as part of the latest educational reform, but does not undertake this on a regular basis. In Scotland, qualifications are regularly reviewed by the SQA, but only in the negative sense: qualifications with little or no uptake are systematically culled, but there is no proactive investigation of the need for new training pathways, which require a business case and external resource to develop. The appropriateness of existing qualifications' content is regularly reviewed, but the most influential stakeholders are often the largest construction firms, who skew toward new-build construction rather than repair, maintenance and craft skills.

ADULT LEARNING AND PROFESSIONAL DEVELOPMENT

The three countries have a widely differing approach to the role of education through later life. Culturally, Poland seems to have a lack of interest or emphasis on adult training and mid-career development, which is reflected in its place at the lowest end of adult training participation in the EU, and in its relative lack of support for adult training. In Poland, apprenticeship is strictly age restricted and is tied to status as a 'young worker' age 15–18, and any post-secondary later learning opportunities are geared toward the remedial: the unemployed, at-risk, and disengaged. This makes the window of opportunity for deciding the course of one's entire career very narrow, and does not offer much support in the case of those who reconsider or wish to change paths. Further, it seems to point to a culture that views development or further training as deviant from the norm, with most citing a lack of need as the main reason for not participating in training, rather than a lack of opportunity.

Scotland has a similarly low participation rate in adult training, particularly within the construction industry, with the main reason again being a lack of need. Furthermore, despite the fact that most construction operatives in the repair and maintenance sector are self-employed or SMEs, most training is undertaken by employees of large new-build firms, which may reflect obstacles to access or a lack of employer support in smaller, more poorly-resourced firms. In Scotland, however, apprenticeships are not age restricted, and the opportunities for changing course or returning to education are available, financed by universal four years of higher education, as well as annual individual learning stipends (though at £200, these are unlikely to cover much). Research over the last decade has consistently shown a shortage of skills across the board in the construction industry – particularly in repair and maintenance – with contractors finding it increasingly difficult to find skilled staff, despite higher than ever rates of qualification. The cited 'lack of need' of training is perhaps more a reflection of a cultural bias against education in adulthood, rather than a real reflection of competence in the workforce.

Norway, on the other hand, has almost universal participation in adult training, with most Norwegian adults taking part in mid-career training or adult education at some point in their lives. The emphasis on lifelong education is built into Skills Development Norway, which is also the Norwegian Agency for Lifelong Learning, and there is also a national charity devoted to adult learning. Special effort is made to overcome Norway's difficult geography through investment in remote-access learning, and special funding is available to businesses who take on adult apprentices. Furthermore, Norway has also created good pathways for recognition of prior learning – crucial in quantifying the skills being imported through immigration – and for acquiring qualifications based on experience, outwith the normal education system. This last factor by default recognises the importance of competence over qualification – quality over quantity as far as skills are concerned. What's more, Norway also has dedicated state education institutions for adult learning and training in different fields, whereas in both Scotland and Poland the training landscape at the professional level tends to be fragmented and ad hoc.

TEACHING IN VET

One feature of VET education in Scotland is that teachers both at the school and the college level have little interaction with the real workplace once they have become teachers. Besides some CPD requirements, teachers spend very little time in the workplace, and practitioners do not usually deliver taught training. In both Poland and Norway, the need for closer links between classroom and workplace has been recognised, with teachers in Poland doing regular in-company experience as part of the latest educational reforms. In Norway, a state-subsidised secondment programme allows teachers to take time working in the field, and for practitioners to spend time as secondary instructors. A closer interaction between classroom and workplace in Scotland would inevitably improve the relevance of training at the school and college level, and would foster a stronger sense of employer pride in passing on skills.

CONCLUSIONS

Scotland's Curriculum for Excellence represents an enormous step forward in the aim of producing capable and confident individuals, and in orientating the aim of education toward holistic development of skills. Initiatives such as the introduction of construction NPAs at Levels 4 and 5 and the DYW programme represent meaningful progress toward an education system that prepares students for the workplace, in addition to university. Building upon these efforts, there are further lessons to be learned from the examples set abroad. While Europe in general has enjoyed the boom of the construction industry, the rising tide does not equally raise all boats. The force of a powerful market and enormous investment in new construction and technology make traditional crafts arguably more vulnerable than ever. In order to create feasible and attractive training pathways into traditional skills, Scotland can take further its existing initiatives, and look especially to the Norwegian system in lessons for what creates a vibrant and sustainable craft tradition:

1. Fight for the cultural status of craftspeople and vocational workers by reinforcing an image of skilled manual work as fulfilling and important. This effort has already begun amid the growing recognition that universities are turning out more graduates than can find employment, at the expense of manual industries that see their skills base dwindling, resulting in a less skilled population overall. A wider and more interesting variety of modules in craft offered at the school level will increase the attractiveness of the sector and allow students to engage more meaningfully in these aspects of their education.

2. Increase remote access and overcome geographical limitations. This may be as simple as expanding opportunities for online learning, but can also encompass more complex solutions, such as the evening out of subject provision at colleges across the country, and increased flexibility in the in-classroom training options tied to apprenticeships, which can make location and commuting the deciding factors in a career path.

3. Introduce earlier, more meaningful exposure to vocational subjects such as construction crafts in schools. The success of pilot programmes like those delivered at St Modan's demonstrate that students who experience high quality tuition in crafts from an earlier age have a chance to deepen their interest, establish better relationships with local employers and understand earlier whether a certain path will suit them. Increasing the variety and complexity of the offerings by removing restrictions on material study, introducing qualifications earlier and teaching through complex, challenging projects will build pride and increase the esteem and perceived value of such pathways.

4. Put in place measures to protect and foster rare or endangered crafts through funding and incentives, rather than forcing them to compete against large-volume, market-driven occupations. Incentivise colleges and the SQA to take responsibility for looking after training and qualifications in such areas, rather than evaluating their worth exclusively by return on investment. Taking such measures will raise the esteem and increase opportunities in trades that are a significant and necessary part of a vibrant construction sector, and will result in a more skilled and fulfilled population for Scotland.

NOTES

1 Rolf K. Andersen, Bard Jordfald. 'Workers in the construction industry in 2008 and 2014', *Fafo Report,* (2016), p. 7.
2 David Nikel. 'Construction jobs in Norway', *Life in Norway* (6 March 2017), www.lifeinnorway.net/construction.
3 Margareth Haukås; Kjersti Skjervheim. 'Vocational education and training in Europe - Norway', *Cedefop ReferNet VET in Europe reports* (2018), p. 9.
4 David Nikel. 'Norway's workforce shortage increases', *Life in Norway* (12 May 2019), www.lifeinnorway.net/norways-workforce-shortage-increases.
5 OECD. *OECD skills strategy diagnostic report: Norway* (2014), p. 18.
6 David Nikel. 'Construction jobs in Norway', *Life in Norway* (6 March 2017), www.lifeinnorway.net/construction.
7 Rolf K. Andersen, Bard Jordfald. 'Workers in the construction industry in 2008 and 2014', *Fafo Report*, (2016), p. 7.
8 Ibid, pp. 19-20.
9 Ibid, p. 32.
10 David Nikel. 'Construction jobs in Norway', *Life in Norway* (6 March 2017), www.lifeinnorway.net/construction.
11 Rolf K. Andersen, Bard Jordfald. 'Workers in the construction industry in 2008 and 2014', *Fafo Report*, (2016), pp. 13-14.
12 Palmer Johnson. 'The Norwegian system of public secondary education', *The School Review,* vol. 44 (8), pp. 608–14.
13 Margareth Haukås; Kjersti Skjervheim. 'Vocational education and training in Europe - Norway', *Cedefop ReferNet VET in Europe reports* (2018), pp. 10-11.
14 Ibid.
15 Ibid, p. 14.
16 Ibid, p. 12.
17 Ibid.
18 Ibid, pp. 14-15.
19 Utdannings.no. 'Fagskole: Høyere yrkesfaglig utdanning som varer fra et halvt til to år (Vocational school: higher vocational education lasting from six months to two years)', utdanning.no/tema/utdanning/fagskole.
20 Margareth Haukås; Kjersti Skjervheim. 'Vocational education and training in Europe - Norway', *Cedefop ReferNet VET in Europe reports* (2018), p. 8.
21 Skills Norge. 'Skills Norway in English', www.kompetansenorge.no/English.
22 Voksenopplæringsforbundet (The Adult Education Association - or VOFO). 'Voksenopplaeringsforbundet Studieforbundenes Interesseorganisasjon (The Norwegian Association for Adult Learning)', www.vofo.no/en.
23 The Federation of Norwegian Construction Indusries (BNL). 'Byggenaeringens Landsforening – in English', www.bnl.no/in-english.
24 ICHNGO Forum. 'Norwegian Folk Art and Craft Association,' www.ichngoforum.org/norwegian-folk-art-craft-association.
25 Norsk Handverksinstitutt Senter For Immateriall Kulturarv. 'This is Norwegian Crafts Institute,' https://eng.handverksinstituttet.no/about2.
26 Margareth Haukås; Kjersti Skjervheim. 'Vocational education and training in Europe - Norway', *Cedefop ReferNet VET in Europe reports*, p. 18.

NOTES

27 Ibid, p. 39.
28 Ibid, p. 33.
29 David Nikel. 'Construction jobs in Norway', *Life in Norway* (6 March 2017).
30 Jon Stotz. 'Average and minimum salary in Norway,' (17 January 2021), Check In Price, checkinprice.com/average-minimum-salary-in-oslo.
31 Margareth Haukås; Kjersti Skjervheim. 'Vocational education and training in Europe - Norway', *Cedefop ReferNet VET in Europe reports*, p. 28.
32 Ibid, pp. 29-30.
33 Ibid, p. 30.
34 Reproduced with permission of Voss Vidaregåande Skule.
35 Businesswire. 'Poland construction industry forecasts (2013-2022) by value and volume across 40+ market segments', (10 April 2018), www.businesswire.com/news/home/20180410006127/en/Poland-Construction-Industry-Forecasts-2013-2022-Volume-40.
36 European Commission. *European construction sector observatory: country profile Poland* (March 2018).
37 Ramboll. 'Bottleneck vacancies in Poland', *Mapping and analysing bottleneck vancancies in EU labour markets* (2014), ec.europa.eu/social/BlobServlet?docId=12666&langId=en.
38 Kariera.pl. 'Oto lista najbardziej poszukiwanych zawodów w 2017 roku (The most wanted professions in 2017)' (June 2017), www.kariera.pl/artykuly/oto-lista-najbardziej-poszukiwanych-zawodow-w- 2017-roku/
39 European Commission. *European construction sector observatory: country profile Poland* (March 2018), p. 16.
40 Monika Czechowska. 'Craftsman. Who is a craftsman in construction? Regulations for craft activities have changed' (9 January 2020), www.muratorplus.pl/biznes/prawo/rzemieslnik-kim-jest-rzemieslnik-w-budownictwie-weszly-zmiany-przepisow-dla-dzialalnosci-rzemieslniczej-aa-KnUK-J4H6-m5PY.html.
41 European Commission. *European construction sector observatory: country profile Poland* (March 2018), p. 16.
42 Monika Czechowska. 'Craftsman. Who is a craftsman in construction?'.
43 Ibid.
44 Statistics Poland. *Women and men on the labour market* (2018), p. 9.
45 A. Chłoń-Domińczak et al. 'Vocational education and training in Europe – Poland' (2019), *Cedefop ReferNet VET in Europe reports* (2018), p. 12.
46 European Commission, 'Poland: organisation of the education system and its structure' (18 January 2021), *Eurydice*, eacea.ec.europa.eu/national-policies/eurydice/content/organisation-education-system-and-its-structure-56_en.
47 A. Chłoń-Domińczak et al. 'Vocational education and training in Europe – Poland' (2019), p. 7.
48 Ibid, p. 15.
49 CEDEFOP. 'European database on apprenticeship schemes: Poland' (2016), www.cedefop.europa.eu/en/publications-and-resources/data-visualisations/apprenticeship-schemes/country-fiches/poland.
50 Ibid.
51 Ibid.
52 CEDEFOP. 'European database on apprenticeship schemes: vocational preparation of young workers (Poland)' (2019), www.cedefop.europa.eu/en/publications-and-resources/data-

NOTES

visualisations/apprenticeship-schemes/scheme-fiches/vocational-preparation-young-workers.

53 A. Chłoń-Domińczak et al. 'Vocational education and training in Europe – Poland' (2019), p. 37.

54 Ibid, p. 27.

55 The European gateway for women's entrepreneurship (WEgate), 'Polish Craft Association', wegate.eu/learn/training-programmes-organizations/zrp-zwi%C4%85zek-rzemios%C5%82a-polskiego-%E2%80%93-polish-craft-association.

56 A. Chłoń-Domińczak et al. 'Vocational education and training in Europe – Poland' (2019), p. 14.

57 Polski Zwiazek Pracodawcow Budownictwa (Polish Association of Construction Employers). 'About us,' pzpb.com.pl/about-us/.

58 A. Chłoń-Domińczak et al. 'Vocational education and training in Europe – Poland' (2019), p. 33.

59 European Commission. *European construction sector observatory: country profile Poland* (March 2018), p. 13.

60 Ibid, p. 33.

61 KKZ Zespol Szkol (KKZ school complex). 'O nas (About us)', kkz.edu.pl/o_nas.

62 ConstructionSkills Research. 'Sector skills assessment for the construction sector 2009', *ConstructionSkills UK report* (2009), dera.ioe.ac.uk/3721/1/ssareportfull2009_tcm17-17996.pdf.

63 Construction Industry Training Board (CITB). *Construction skills network forecasts 2011-15* (2011), p. 6.

64 Historic Scotland; Scottish Enterprise; ConstructionSkills; Scottish Qualifications Authority (SQA). *Scottish traditional building skills audit scoping exercise* (2010), p. 26.

65 ConstructionSkills Research. *ConstructionSkills UK report* (2009), p. 54.

66 Ibid, p. 53.

67 Historic Scotland et. al. *Scottish traditional building skills audit*, p. 16.

68 Ibid, p. 39

69 National Heritage Training Group. *Traditional building craft skills: assessing the need, meeting the challenge* (2007).

70 Historic Scotland. *Traditional building skills: a strategy for sustaining and developing traditional building skills in Scotland* (2011), p. 15.

71 ConstructionSkills Research. *ConstructionSkills UK report* (2009), p. 26.

72 Skills Development Scotland. *Full year report 2018/19 – Modern Apprenticeship statistics* (2019), p. 8.

73 ConstructionSkills Research. *ConstructionSkills UK report* (2009), p. 27.

74 Education Scotland. 'Broad general education,' education.gov.scot/education-scotland/scottish-education-system/broad-general-education.

75 ParentZone. 'Learning in Scotland,' education.gov.scot/parentzone/learning-in-scotland/curriculum-areas.

76 Education Scotland. 'Technologies', education.gov.scot/education-scotland/scottish-education-system/policy-for-scottish-education/policy-drivers/cfe-building-from-the-statement-appendix-incl-btc1-5/curriculum-areas/technologies.

77 ParentZone. 'What is the senior phase,' education.gov.scot/parentzone/learning-in-scotland/senior-phase/what-is-the-senior-phase.

78 SQA. Group award specification for National Progression Award (NPA): construction craft and technician at SCQF Level 4, (June 2020), www.sqa.org.uk/sqa/90719.html. SQA, Group award specification for NPA construction skills at SCQF Level 5, www.sqa.org.uk/sqa/94698.html.

NOTES

79 Education and Skills Committee. *Subject Choices in Schools* (2019), p. 14.
80 Skills Development Scotland. *Full year report 2018/19 – Modern Apprenticeship statistics*, p. 8.
81 Willy Roe. *Review of post-16 education and vocational training in Scotland* (2011), p. 136.
82 Ibid, p. 32.
83 Historic Scotland. *Traditional building skills* (2011), p. 19.
84 National Heritage Training Group. *Traditional building craft skills: assessing the need, meeting the challenge* (2007).
85 Willy Roe. *Review of post-16 education and vocational training in Scotland* (2011), p. 41.
86 SQA. 'Qualification development toolkit for centres,' www.sqa.org.uk/sqa/64446.html.
87 CITB. 'Our role,' www.citb.co.uk/about-citb/what-we-do/our-role.
88 Construction Scotland. 'Home,' www.cs-ic.org/constructionscotland.
89 Federation of Master Builders. 'About the FMB', www.fmb.org.uk/about-the-fmb.
90 Henry Hepburn. 'Vocational education gaining popularity in Scottish schools, finds report', *Times Education Supplement* (10 January 2018), www.tes.com/news/vocational-education-gaining-popularity-scottish-schools-finds-report.
91 Willy Roe. *Review of post-16 education and vocational training in Scotland* (2011), p. 111.
92 Developing the Young Workforce. *Scotland's youth employment strategy. Fourth annual progress report 2017-2018* (2018), p. 21.
93 Willy Roe. *Review of post-16 education and vocational training in Scotland* (2011), p. 93.
94 ConstructionSkills Research. *ConstructionSkills UK report* (2009), p. 45.