OECD Reviews of Vocational Education and Training

A Skills beyond School Review of Israel

Pauline Musset, Małgorzata Kuczera and Simon Field



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Summary: Strengths, challenges and recommendations

Strengths

- The system is diverse, with relatively good labour market outcomes for graduates. Bearing in mind the range of different options, including not only practical engineering and technician training and vocational courses, but also professional certifications, diverse private courses, as well as a range of targeted programmes directed at disadvantaged groups, the system offers options for most of the relevant student groups.
- There is an active framework of government-led reform in the Ministry of Economy and other government ministries and agencies, with plans to put vocational education and training on a statutory basis through legislation. The social partners – both employers and unions – are well organised and are keen to engage more fully in the vocational education and training system. There have been praiseworthy efforts to promote innovation in delivery.
- The certification system provides an effective means of upskilling. Occupational certifications are administered by the Ministry of Economy in more than 100 different professions. Some 70 000 people each year take these examinations, sometimes at the end of an educational programme and sometimes as a stand-alone examination.
- Although data remain a challenge, research and analysis are well-developed by international standards, with a strong capacity for research in universities and research institutes, often with international reputations.

Challenges and recommendations

Tackling the skills challenge

Challenge: A number of serious and growing skills challenges threaten the Israeli economy: employers are voicing concern about the inadequacy of vocational skills; a wave of retirements affecting highly-skilled migrants from the former Soviet Union will substantially exacerbate skills shortages; and enhanced vocational provision is necessary to tackle low economic activity rates in the growing Arab, Israeli and Haredi populations. But despite these growing pressures, there is less vocational provision than in many other OECD countries, and funding in the sector is inadequate and sometimes declining.

Recommendation: In the face of serious and growing skills shortages, exacerbated by demographic change, take decisive action, supported by adequate funding, to launch a strategic expansion of high-quality vocational education and training programmes, guided by partnership with industry, and underpinned by legislation. Make the vocational skills learnt during the military service more transparent and transferable.

Strengthening co-ordination and social partner engagement

Challenge: In Israel the different parts of the vocational education and training (VET) system are subject to uncoordinated governance systems. This makes the system difficult to navigate for students, and inhibits social partner engagement.

Recommendation: Establish a national body involving all the key stakeholders, including the ministries, employers and unions to provide strategic guidance on the development of the VET system.

Building an effective framework of work-based learning

Challenge: Despite all the benefits of work-based learning, both as a powerful learning tool and as a means of encouraging partnership with employers, work-based learning is little used in the vocational system.

Recommendation: Integrate work-based learning systematically into postsecondary vocational programmes, as a mandatory, quality-assured and credit-bearing element. Establish a regulatory framework in support of this end.

Building pathways of access and opportunity for vocational students

Challenge: Graduates of vocational tracks at the upper secondary level often face obstacles in entering postsecondary programmes, which damages the status of these vocational tracks. Although many graduates of practical engineering programmes enter university programmes, when they do so they often fail to receive adequate recognition for their practical qualifications.

Recommendation: Take steps: *i)* to improve the access of upper secondary VET graduates to further learning opportunities, including postsecondary VET; and *ii)* to enhance access to universities and credit recognition for graduates of practical engineering programmes.

Developing a dual-skilled teaching workforce

Challenge: Effective vocational teachers need to meet the demanding "dual requirement" of both pedagogical skills, and practical professional expertise. But rigid and sometimes inconsistent requirements to enter the profession and a capacity to make use of part-time teachers create obstacles to the recruitment of those with significant industry experience. In-service professional development opportunities can be limited, and teacher shortages are likely in the future.

Recommendation: Pursue reforms in vocational teacher policy in the practical engineering and technician programmes to meet the "dual requirement" of industry knowledge and experience alongside teaching skills by:

- Encouraging part-time working arrangements, allowing people with valuable work experience to enter teaching.
- Designing initial teacher education programmes so as to ensure a good mix of pedagogical skills, vocational competence and industry knowledge.
- Converging the entry requirements and training programmes for all teachers of practical engineering programmes to a common standard, under the Ministry of Education and the Ministry of Economy.

Chapter 1

Introduction and initial assessment

This chapter describes the OECD policy study of vocational education and training (VET), the review of the Israel, summarises the main features of the country system, describes previous relevant OECD work on Israel and sets out an assessment of its particular strengths.

The review of Israel and its place in the OECD study

This review is one of a series of country reports on postsecondary vocational education and training (VET) in OECD countries, prepared as part of an OECD study (see Box 1.1). The series includes *reviews*, involving an in-depth analysis of a country system leading to a set of policy recommendations backed by analysis. The *commentaries* are simpler exercises, largely descriptive but also including an assessment of strengths and challenges in the country system. The commentaries are designed to be of value as free-standing reports, but are also prepared so that they can become the first phase of a full review, should a country so wish.

Box 1.1 Skills beyond School: The OECD study of postsecondary vocational education and training

Increasingly countries look beyond secondary school to more advanced qualifications to provide the skills needed in many of the fastest growing technical and professional jobs in OECD economies. The OECD study, *Skills beyond School*, is addressing the range of policy questions arising, including funding and governance, matching supply and demand, quality assurance and equity and access. The study will build on the success of the previous OECD study of vocational education and training Learning for Jobs which examined policy through 17 country reviews and a comparative report. The study also forms part of the horizontal OECD Skills Strategy (OECD, 2012).

Full country policy reviews are being conducted in Austria, Denmark, Egypt, Germany, Israel, Netherlands, Korea, Switzerland, the United Kingdom (England), and the United States (with case studies of Florida, Maryland and Washington State). Shorter exercises leading to an OECD country commentary are being undertaken in Belgium (Flanders), Canada, Iceland, Romania, Spain, Sweden and in Northern Ireland and Scotland in the United Kingdom. Background reports will be prepared in all these countries, and in France and Hungary.

See: www.oecd.org/education/vet

In 2012, the OECD prepared a commentary on Israel that was then, at the request of the Israeli authorities, promoted to a full review. The Israeli authorities provided a background report (MOITAL, 2012a) following which an OECD team made a visit to Israel on 18-20 April 2012 and again on 9-12 September 2013, to meet and discuss with a wide variety of policymakers, employers, teachers, students and other stakeholders involved in different way in the Israeli postsecondary VET system.

The structure of the report

This chapter describes the context of the wider OECD study, outlines the main features of the Israeli postsecondary system, and compares some of its main features with those of other countries. It also sets out a number of key statistical indicators comparing Israel with other OECD countries. These cover both the education system and the labour market. It then provides an assessment of the main strengths of the system.

Later chapters advance policy recommendations, set out as:

- *The challenge* – the problem that gives rise to the recommendation.
- *The recommendation* – the text of the recommendation.
- *The supporting arguments* – the evidence that supports the recommendation.

A snapshot of the system

The labour market

The Israeli economy has coped well with the global economic crisis, with much lower rates of unemployment than the euro area (OECD, 2013a). But Israel has a relatively large number of people outside the labour market, with working age labour force participation at 66% compared to the OECD average of 77% (OECD, 2013a). Arab-Israelis and Haredi (ultra-Orthodox) Jews are very often not in work. According to OECD (2013b), close to 60% of the Arab population and the Haredi population live in poverty.

Of Israel's (mainly urban) population, three-quarters are Jewish and most of the remaining quarter (20% of the total) are Arab-Israelis. In the 1990s a wave of relatively well-educated Jewish immigrants from Russia, (now accounting for 8% of the population) filled the need for higher level technical and engineering skills in industry. But many of these migrants are now approaching retirement age. This factor, alongside technology-driven demand, will fuel increased demand for higher level skills in the future.

Self-reports suggest that demand for upskilling in the workforce is relatively high. In Israel 33% of employees reported needing further training to carry out their duties at work, more than the OECD average of 22%. One-quarter of employees identify themselves as over-qualified, similar to the OECD average (Quintini, 2011).

Education and training for young people

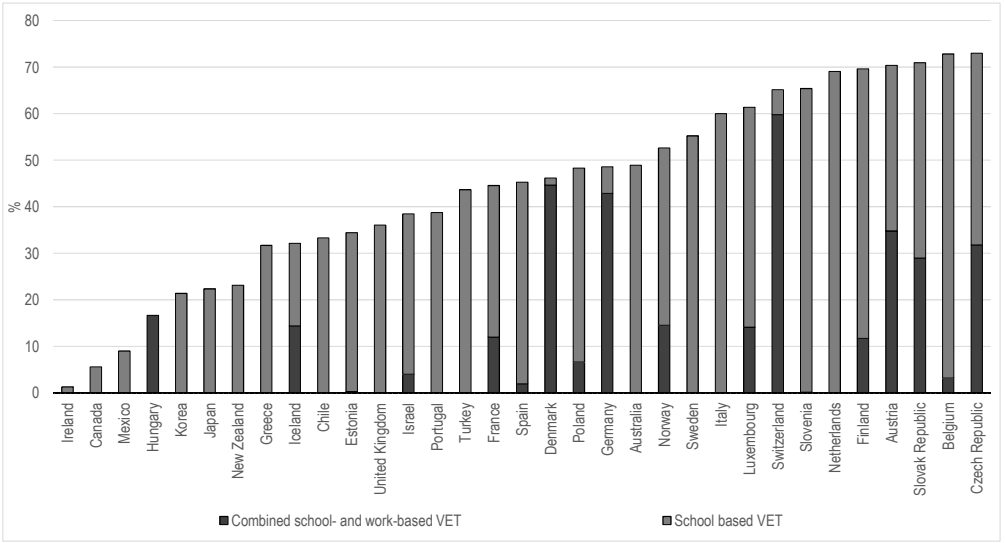
Compulsory education

Education is free and obligatory for children aged 5-18 in twelve grades of compulsory education. Upper secondary education lasts three years (grades 10 to 12) and the typical entrance age is 15 (CBS, 2011). The majority (60%) enrol in general academic upper secondary education, one-third opt for technological programmes and only 3% enrol in industrial schools or apprenticeship pathways combining school and work-based training (see Figure 1.1 for comparable figures from other OECD countries). Studies in industrial schools and schools for apprentices include 14 different areas of training and some 80 subjects of study. Upon completion of all the requirements, graduates in the youth frameworks are eligible for a Completion Certificate in accordance with the eligibility rules for each study track. Students who have completed their studies in regulated vocations or ones that have been declared by law as vocations requiring apprenticeship, licensing or certification, are also entitled to a Vocation Certificate.

General and technological upper secondary education both lead to the *Bagrut* matriculation exam normally required for entry to academic postsecondary education. Apprentices do not take the full *Bagrut* examination, thus limiting their postsecondary options to some vocational postsecondary institutions where entry requirements are typically lower.

Figure 1.1 How many upper secondary students are enrolled in vocational programmes

2011



Source: OECD (2013c), *Education at a Glance 2013: OECD Indicators*, Table C1.3, OECD Publishing, Paris, doi: http://dx.doi.org/10.1787/eag-2013-en

90% of 25-34 year-olds in Israel as a whole have at least upper secondary qualifications, higher than the OECD average of 82% (OECD, 2013c, Table A1.2a).

Tertiary education

There are seven campus universities, the Open University, and 50 academic colleges and colleges of education (OECD, 2009). In 1993 the system was reformed to expand the offer, yielding a binary system of universities focusing on research, and colleges concentrating on teaching. Both universities and colleges grant academic degrees. Enrolment has doubled since the 90s with almost half of the students leaving grade 12 transferring to higher education (Volansky, 2010).

In 2007, 42% of 25-34 year-old Israelis had a tertiary qualification, rather more than the OECD average of 34%. Only 26% of 25-34 year-old Arabs hold a tertiary qualification and tertiary attainment is very low among Haredis. The government has launched a number of initiatives to increase educational attainment in these populations, and in recent years the number

of Haredi students pursuing tertiary education has risen from 500 to about 3 300 (OECD, 2009).

Postsecondary VET in Israel

Diverse forms of provision

This review gives particular attention to two main types of provision, the "practical engineering" and "technician" programmes, and vocational courses, described below. But postsecondary VET for adults also includes some other programmes:

- The Israeli Ministry of Economy co-operates with employers in providing training in companies. There are three main programmes: On the Job Training in Industry (OJT), "a Class in the Workplace" and internships (MOITAL, 2012).
- Other ministries also provide training programmes in the sectors for which they are responsible, such as the tour guide programme offered by the Ministry of Tourism.
- There are many vocational programmes at bachelor level and above in universities and other tertiary academic institutions.
- Occupational examinations are administered by the Ministry of Industry, Trade and Labour (MOITAL) in more than one hundred different professions.
- A wide range of *ad hoc* courses and programmes, without accreditation or regulation, are provided by the private sector.

Practical engineering and technicians programmes

Practical engineering programmes are two years full-time or three years part-time (2 200 hours of study), leading to a postsecondary diploma. A much smaller number of people (around 5-10% of those pursuing practical engineering programmes) pursue technician studies, which are one year in full-time education and two years part-time (1 600 hours of study) leading to a lower level postsecondary diploma. These two programmes, provided in 73 technical colleges across the country, lead to national exams and a national qualification. Typically people pursue these programmes after national military service (when they may be in their early 20s), but also later in life. The total number of students enrolled in practical engineering and technical programmes increased by 6% between 2007 and 2011.

Admission to these programmes normally requires 12 years of schooling and a matriculation examination in mathematics and also Hebrew and English passed at the minimum level (less demanding than the entry requirements for universities typically requiring passes in six subjects). Those who do not meet these entry requirements can enrol in preparatory courses leading to an admission test (MOITAL, 2012a). 42% of those in preparatory courses pass the test and enrol in a programme (see Box 5.1). Admission criteria for individuals over 30 include eight years of relevant work experience in addition to twelve years of schooling (i.e. less than partial matriculation). Those who meet these requirements can enrol in a special programme of 1 200 hours instead of 1 700.

Graduates of the technician programmes can continue their studies by entering a practical engineering programme, often in the same institution. Graduates of practical engineering programmes can continue their education in a university through a bachelor degree, although this transition depends on individual arrangements between institutions (see Chapter 5).

The practical engineering programmes may be compared with similar short-cycle programmes in many countries – for example, the short-cycle technical programmes in Danish academies; two-year associate degrees in technical subjects in community colleges in the United States; the two-year programmes in *Fachschulen* in Germany; and two-year postsecondary programmes in Spain. All these programmes provide qualifications which allow for direct labour market entry, as well as potential entry to university programmes.

Vocational courses under the Ministry of Economy

The main function of these courses is labour market insertion or reinsertion. Students are primarily young adult job seekers (typically 28-35 year-olds) who report to the employment service and are referred for vocational training. About half are trainees in receipt of income support, the other half are unemployed job seekers and those with low skilled or unsteady jobs who wish to upgrade their skills. Counsellors in the employment agency advise on course choice. In certain courses there is an entry examination– for example, when there is a mathematical requirement. But in these cases there are also access courses to develop the relevant skills.

The training and retraining is typically provided through government training centres and private providers under the supervision of the Ministry of Economy and cover a wide range of occupations, for example, electricians, furniture makers, mechanics, jewellers, computer technicians, builders, secretaries and book-keepers.

Courses are 3-11 months in length, with an average of six months (e.g. courses in technological subjects last ten months). The courses are mostly full-time 40 hours per week, but some are run on a part-time basis. Those who want to make a change in career direction are often already in work and therefore usually wish to study in the evenings and on Fridays. In some courses there are short internships of one to two months with employers during the last few months of the programme. Courses end with an exam managed by an external body. About 90% of those who start the courses take the exam.

Some special programmes are organised for disadvantaged groups including Haredi Jews and Arab Israelis. The percentage of non-Jewish participants in vocational programmes has increased from 13.2% in 2001 to 24% in 2010, reflecting declining total numbers as much as any absolute growth in the number of non-Jewish participants (MOITAL, 2012a). The Haredi community requires women to be segregated from men – so the training facility and the working arrangements of firms need to reflect this. Haredi men often go just for eight years of school in religious schools for the Haredi focusing on Talmudic education. As a result they often lack basic skills (e.g. in mathematics) potentially hindering their participation in vocational education and training and any other type of postsecondary education.

Role of the army

National military service is compulsory at the age of 18 for most Israeli citizens; Arab-Israeli and Haredi Jewish citizens are exempt. Men serve three years while women serve two years. By entering a technician or practical engineering programme students can postpone their military service for two years and then enter technology-related positions in the army (MOITAL, 2012a).

Governance of the system

The general academic and technological tracks of upper secondary education are under the supervision of the Ministry of Education, and the industrial schools, and schools for apprentices, are under the Ministry of Economy. About half of the technological schools are managed by technical education networks, such as ORT and AMAL. Others are managed by private networks such as Atid and Badameh, while the rest are administered by local councils. The operating budget, including wages, is mainly paid by the state, based on student numbers, the range of study tracks, and the expertise and seniority of the teaching staff (Eisenberg, 2006). The

curricula, the examinations and the certificates are supervised by the Ministry of Education.

As for postsecondary practical engineering and technician programmes, the Institute for Training in Technology and Science (MAHAT), under the authority of the Ministry of Economy, supervises the training of technicians and practical engineers (for adults after the completion of the military service). The Ministry of Education supervises a different and separate set of practical engineering and technician programmes (for young people directly after the completion of upper secondary education). (See Chapter 3 for more details about the governance challenges.)

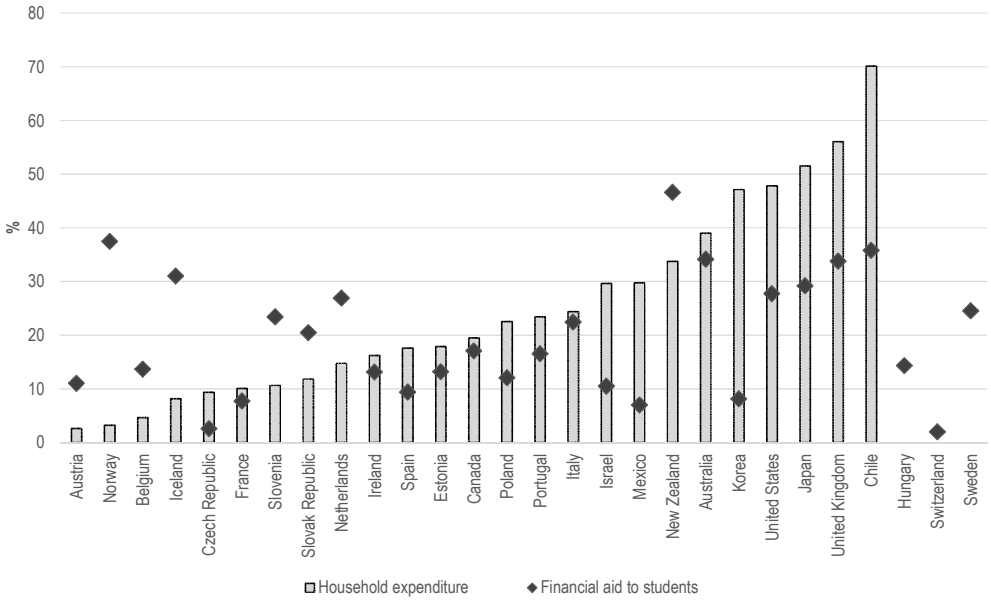
Funding

In Israel most forms of postsecondary education and training require fees. In practical engineering programmes fees for full-time students are approximately ILS 8 500 (EUR 1 700) a year (MOITAL, 2012a), with some variation between programmes under the Ministry of Education and programmes under the Ministry of Economy. These fees cover about half of the costs, the remainder being covered by public subsidy.

Household expenditure on tertiary education, (at 29% of the total) is higher than in many other OECD countries (OECD, 2013c, Table B3.2b). In many countries this burden is alleviated by subsidies for grants and loans, but in Israel this only represents 11% of the total public expenditure on tertiary education (OECD, 2013c Table B5.4), less than many other countries charging tuition fees at postsecondary level such as the United States, Canada and Japan (see Figure 1.2 below).

Figure 1.2 How much do families spend on tertiary education?

Household expenditure as a percentage of total expenditure for tertiary education and financial aid to students as a percentage of public expenditure for tertiary education (2010)



Notes: Financial aid to students includes: scholarships and grants to households and student loans. Reference year 2009 for Canada, 2011 for Chile.

Source: OECD (2013c), *Education at a Glance 2013: OECD Indicators*, Tables B3.2b and B5.4, OECD Publishing, Paris, doi: http://dx.doi.org/10.1787/eag-2013-en

The Ministry of Defence plays an important funding role for veterans. After discharge, a veteran is eligible for a study grant during five years. Discharged soldiers in preparatory courses and in the first year of practical engineering studies benefit from a 90% discount on the fees. In some sectors (like mechanical engineering) this can be continued into the second year. Up to 50% of the students therefore receive substantial discounts. Soldiers from disadvantaged backgrounds can also participate in a training programme sponsored by the Ministry of Defence and MOITAL facilitating their reinsertion into civilian life (MOITAL, 2012).

Previous OECD analysis and recommendations

The 2009 OECD economic survey for Israel (OECD, 2009), the 2010 review of the labour market and social policies for Israel (OECD, 2010) and

the OECD higher education in regional and city development review for the Galilee region (OECD, 2011) are all relevant to the current exercise.

The economic survey argues that better incorporation of minorities into the education system would help to address the lower educational outcomes of Arab Israelis. It notes the substantial attainment and achievement differences within the Arab-Israeli population, with Bedouins at the bottom end of the distribution, while the attainment of Druze and Christian populations is as high as those of the Jewish majority (OECD, 2009).

The survey points to the lower level of participation in postsecondary education among Haredi men and argues that more vocationally-oriented learning is needed. Stronger vocational skills, particularly among men, should lead to an increase in the employment rates. It also recommends that state funding for Haredi primary and secondary schools should depend on the use of a government-mandated core curriculum (OECD, 2009).

The OECD review of labour market and social policies in Israel (OECD, 2010) argues that differences between the Jewish and Arab education systems are among the factors causing poor socio-economic outcomes for the Arab-Israeli population. Other factors include socio-cultural restrictions on women in Arab communities, inadequate policies to include minorities and labour market discrimination by individual employers (OECD, 2010).

At the same time, the OECD has recognised the initiative of the government in fostering partnerships to help integrate minorities into the labour market. One example is "TEVET", a partnership between the Israeli government and the American Jewish Joint Distribution Committee designed to help young people in vulnerable groups get jobs through vocational programmes. In addition, a series of active labour market policies have been pushed forward by the Prime Minister's office including the establishment of private investment funds, the promotion of employment among Arab women, wage subsidies, and research and development (R&D) centres in the north of the country (OECD, 2010).

The OECD higher education in regional and city development review for the Galilee region in Israel (OECD, 2011) recommends that tertiary education institutions monitor the labour outcomes of graduates so as to better adapt their programmes to regional labour market needs, and to improve labour market outcomes for their students (OECD, 2011).

The 2013 OECD economic survey notes that despite positive developments in terms of falling unemployment and rising labour force participation, Israel's challenges in social policy and education remain profound. High relative poverty and weak labour-force attachment in Arab-Israeli and ultra-Orthodox communities along with low earnings

capacity and problems in the education system all play a role. Concerning equity and policy towards minorities, the survey recommended more strenuous affirmative action, particularly in regard to Arab-Israeli students and encouraging more forcefully the teaching of core secular subjects in Haredi schools (OECD, 2013d).

Strengths of the postsecondary system in Israel

Effective diversity

Across OECD countries, postsecondary VET systems serve diverse purposes for different client groups. They can provide higher level job-specific training for young upper secondary graduates (such as in teacher training and nursing programmes in university colleges in Denmark); upskilling for working adults in mid-career (for example industrial master examinations in Germany, which prepare skilled workers to be foremen); "second chances" for working adults who dropped out of earlier education or training programmes (the US community colleges with open access policies serve this function among others); and opportunities for career shifts or to support a return to the labour market. An effective system should be able to meet all of these quite diverse needs.

In Israel, the system is diverse, with relatively good labour market outcomes for graduates. According to available data from an unrepresentative survey, 74% of those who participated in voucher programme vocational courses were employed five months after completion, with 47% of them working in an occupation for which they were trained, 22% were unemployed and 5% were outside the labour market (MOITAL 2012b). Among those who graduated from the practical engineering programme, 46% were working in the profession studied, and 16% were not working a year after graduation (10% unemployed and looking for work and 6% have left the labour force) (MOITAL, 2012c). Both types of graduate earned more if they worked in a sector they were trained for. These data should be treated with caution since they were collected through follow-up studies in an unrepresentative sample of students.

Bearing in mind the range of different options, including not only the practical engineering and technician training, and vocational courses, but also the professional examinations, university programmes, diverse private sector courses, as well as a range of targeted programmes directed at disadvantaged groups, the system offers options for most of the relevant client groups.

Dynamic policy reform

Across OECD countries, policy development in vocational education and training offers particular challenges because of the wide range of different stakeholders involved. Alongside the students, teachers and parents that play a role in all education systems, labour market actors such as employers and unions are critically important. Nationally and regionally the involvement of the social partners helps to ensure that the overall design of the system, the content of programmes, and the mix of training provision meet labour market needs. Some degree of consensus among the different stakeholders is important, but needs to be balanced by effective leadership to ensure that consensus does not become a formula for inertia, with a multiplicity of stakeholders each holding an effective veto on necessary reforms.

There is an active framework of government-led reform in the Ministry of Economy and other government ministries and agencies, with plans to put vocational education and training on a statutory basis through legislation. The social partners – both employers and unions – are well organised and they are very keen to engage more fully in the vocational education and training system. This high level of engagement is a key strength on which to build. There have also been appraisable efforts in promoting innovation in delivery, through tendering arrangements, in practice since the early 1990s and the voucher system (although there are concerns regarding quality of some providers).

A system of professional examinations

Across OECD countries many professions organise examinations designed either to allow initial access to a profession or to achieve a higher level within the profession. In the Germanophone countries such examinations are used in particular to provide higher level technical and commercial qualifications, and "master craftsman" qualifications to qualified apprentices with some years of work experience in their trade who want to run their own small business. While such industry-led examinations are regulated in the Germanophone countries, they are quite unregulated in the United States, where such exams (or "certifications") are very common. In some cases the examinations are linked to licensed professions, such as electricians, where passing the exam is legally required to work in the profession, or to run a small business. Typically those examinations are tests of competence. While examinees very commonly pursue a course designed to prepare for the exam such courses are not usually obligatory. Examinations of this type therefore have the attractive quality of avoiding the normal constraints of educational programmes of requiring fixed "seat

time" to acquire the qualification. They can also provide a practical way of recognising prior formal and informal learning, often acquired on the job. Recognition of prior learning is the process of "certifying" pre-existing skills and knowledge, including those acquired informally, and on the job. Its many potential benefits are well-known: by making acquired skills more transparent, it improves the efficiency of the labour market; and it supports adults in the advancement of their careers.

In Israel the certification system provides an effective means of upskilling. Occupational certifications are administered by the Ministry of Economy in more than 100 different professions. There are 211 basic certifications, and 76 upgraded ones. Some 70 000 people each year take these examinations, sometimes at the end of an educational programme, and sometimes as a stand-alone examination. The main limitation of this system is that employer engagement is somewhat weak.

Capacity for analysis

Across OECD countries, the development of VET policy depends on good data and the analytic and research capacity to make use of data and conduct evaluations of policy and policy reform. Such a foundation is essential to ensure that policy can be guided by a strong evidence base. As a means of addressing this issue many countries have created dedicated research centres, whose function is to conduct analysis on VET issues. Thus, Australia has developed the National Centre for Vocational Education Research (NCVER), Germany has the Federal Institute for Vocational Education and Training, BIBB (*Bundesinstitute für Berufsbildung*), and Korea the Korea Research Institute for Vocational Education and Training (KRIVET).

In Israel, although data remain a challenge, research and analysis are well-developed by international standards, with a strong capacity for research in academic universities and research institutes, often with international reputations. This is also evidenced by the quality of the background report submitted by the Israeli authorities to OECD (Ministry of Industry Trade and Labour, 2012a).

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Chapter 2

Tackling the skills challenge

A number of serious and growing skills challenges threaten the Israeli economy: employers are voicing concern about the inadequacy of vocational skills; a wave of retirements affecting highly-skilled migrants from the former Soviet Union will substantially exacerbate skills shortages; and enhanced vocational provision is necessary to increase economic activity in the growing Arab Israeli and Haredi populations. But despite all these growing pressures, there is less vocational provision than in many other OECD countries, and funding in the sector is inadequate and sometimes declining. This problem represents a serious challenge to the health of the Israeli economy.

To meet the challenge, this chapter recommends decisive action, backed by legislation, to develop and expand quality vocational education and training (VET) programmes. Such an expansion needs to be guided by partnership with industry, underpinned by legislation and supported by adequate funding. It also recommends making the skills learnt during military service more transparent and transferable.

Challenge: A growing skills shortage threatens the economy

A number of serious and growing skills challenges threaten the Israeli economy. First, employers are already voicing concern about the inadequacy of vocational skills. Second, a wave of retirements affecting high-skilled migrants from the former Soviet Union will substantially exacerbate skills shortages. Third, energetic targeted measures, including a substantial pillar of vocational provision, are necessary to increase economic activity in the growing Arab Israeli and Haredi populations, on grounds of equity and social inclusion, as well as the health of the Israeli economy. Fourth, in the face of all of these challenges, vocational provision in Israel is at a lower level than in many other OECD countries. Fifth, the funding of the sector is inadequate and sometimes declining.

Strong labour market demand for skills

A number of public and private stakeholders routinely express their concerns about the state of VET at the upper secondary level and lack of technical and professional skills, in particular the Israeli Defence Forces (IDF) and the Manufacturers' Association of Israel (MAI) (Nathanson, Levy and Simanovsky, 2010). Virtually all the industrial professions face skills shortages, and the IDF alone are missing some 7 000 practical engineers (Herzog, 2014; Elul, 2013). Some have also suggested that there is a shortage of 15 000 practical engineers alone per year (Peleg, 2012). Data from the Manufacturers' Association of Israel (MAI) indicate a considerable shortage of technicians in Israel, estimated at around 5 000.

Globally, developed countries display a growing demand for postsecondary qualifications (see Box 2.1). In Israel there is a strong demand from students for postsecondary opportunities, probably due to the failure of secondary education to provide adequate job skills: in 2011, around 12 250 individuals – equivalent of 12% of the population of grade 12 students – were enrolled in pre-university colleges or courses (CBS, 2013a; 2013b).

Box 2.1 Demand for postsecondary VET qualifications in other countries

A forecast of employment change in the 27 EU countries between 2010 and 2020 implied that nearly two-thirds of overall employment growth would be concentrated in the "technicians and associate professionals" category - the category (one of nine) most closely linked to postsecondary VET. The same category currently represents only 15% of EU employment (CEDEFOP, 2012). Similarly in the United States, a recent forecasting exercise (Carnevale, Smith and Strohl, 2010) predicts that in the decade to 2018, nearly two-thirds of job vacancies will require more than high school education, but only half of these, or one-third of all vacancies will require four-year degrees or higher qualifications. So nearly one-third of the vacancies will require some postsecondary qualification but less than a four-year degree – in most cases a postsecondary vocational qualification (such as an associate degree, certificate, or certification).

Source: Carnevale, A., N. Smith and J. Strohl (2010), *Help Wanted: Projections of Jobs and Education Requirements Through 2018*, Georgetown University Center on Education and the Workforce. http://cew.georgetown.edu/jobs2018; CEDEFOP (2012), "Future skills supply and demand in Europe: Forecast 2012", Research Paper No 26, Publications Office of the European Union, Luxembourg.

The number of students following engineering programmes in academic colleges and universities have sharply declined since the beginning of the 2000s (by about 4% per year in general, and by over 10% per year in the fields of computer engineering, industry and management engineering, materials engineering, biotechnology, and information systems) (CBS, 2013c).

A wave of retirements will worsen skills shortages

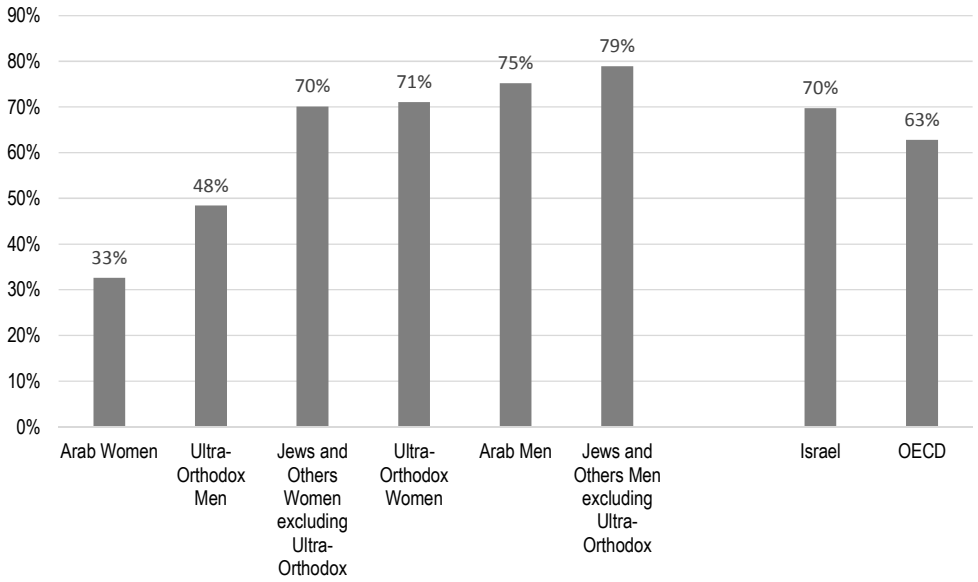
In the 1990s Israel witnessed a wave of migration from the former Soviet Union that increased the working-age population in Israel by 15%. Over 90% of the migrants held a postsecondary or tertiary degree or diploma. More than half of these migrants found employment in blue collar skilled jobs in industry, construction, and agriculture and around one-quarter worked as professionals, technicians and managers – jobs requiring higher level technical and analytical skills (Leshem, 2009; Cohen and Hsieh, 2001). In 2012, there were 115 000 people born in the former Soviet Union (about 3% of the labour force) in ages 55-64, meaning that many are approaching retirement age (CBS, 2013d). The implication is that approximately 100 000 newly trained technical and professional recruits will be needed in the coming decade, just as replacements.

Low economic activity rates in the Arab Israeli and Haredi populations

Currently Arab Israelis and Haredi Jews represent 24% of the population but that will rise to around 35% by 2029 (CBS, 2012). These groups have relatively low participation in the labour market (see Figure 2.1). While few young Israelis are unemployed, 27% of 16-24 year-olds are outside the labour market and not in education, the highest rate among OECD countries[1] (OECD, 2013, Figure 4.1). Arab Israeli and Haredi Jews are particularly overrepresented in this group, a challenge linked to high poverty rates in these populations (see Figure 2.2).

Figure 2.1 Labour market participation in Israel of different population subgroups

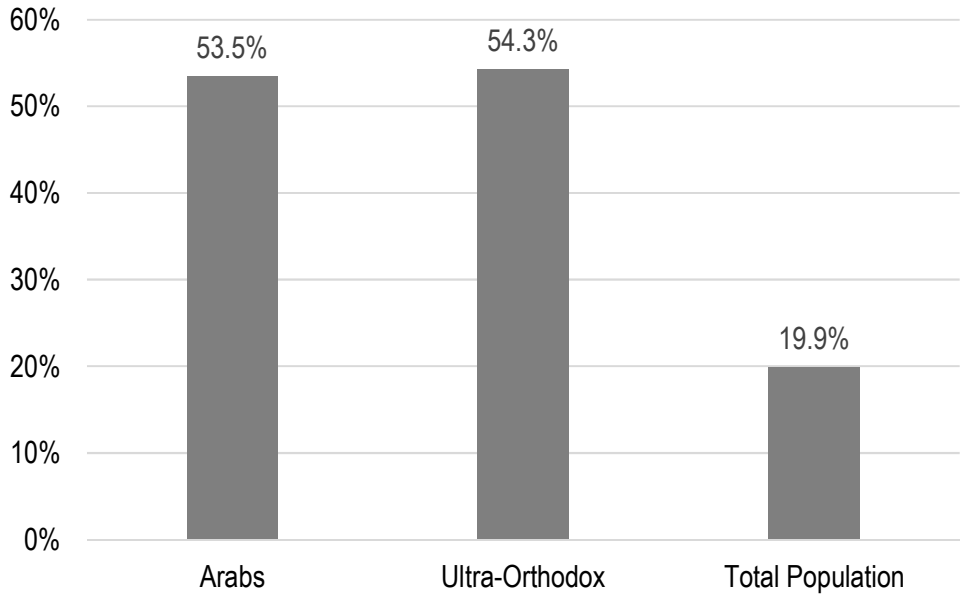
Labour force participation in Israel according to population subgroups - age 20+



Source: Adapted from CBS (2012), *Social Survey*, http://surveys.cbs.gov.il/Survey/surveyE.htm and OECD (2013a), OECD.Stat website, http://stats.oecd.org, accessed December 2013.

Figure 2.2 Poverty rates

Percentage of families living in poverty (2010)



Source: Endeweld, M., et al. (2012), *Poverty Rates and Social Gaps, Annual Report 2011*, www.btl.gov.il/English%20Homepage/Publications/Poverty_Report/Documents/Poverty%20Report_2011.pdf , National Insurance Institute.

The Arab Israeli population group have a limited access to postsecondary education, including vocational programmes. Even though 40% of the student population in upper secondary VET programmes (those under the Ministry of Economy) are Arabs, they represent only 7% of students in practical engineering and technician programmes (CBS, 2013c).

Haredi Ultra-orthodox students face a different challenge, but with similar consequences. Haredi-Orthodox schools offer far less technological courses than other schools (5% of government-religious schools were in vocational or technological tracks in 2010) and even though there are no specific data about their participation in postsecondary VET programmes, anecdotal evidence seems to show that their participation is very limited.

Individuals from these groups are less likely to participate in the labour market, and when they do, more likely to be unemployed. The number of courses available to jobseekers has increased in recent years, but fewer have access to the vocational courses offered by the Ministry of Economy. In

2011, 2% of the unemployed received vocational training either under a traditional vocational training programme (1.7%) or under the voucher scheme (0.3%). The Israeli Public Employment Service resembles an "old style" public employment service, carrying out the employability test as well as vacancy matching, rather than directly providing services to the groups that face difficulties in finding employment (OECD, 2013b).

For most Israelis, military conscription (three years for men and two years for women) intervenes in the transition from school to postsecondary education or work. Most of the Arab and the Ultra-Orthodox[2] populations are exempt. While military service delays entry to the labour market, it also provides skills that have market value in civilian life (see Box 2.2). Conscripts also benefit from army discharge grants allowing many to enter postsecondary education. But post-school support may also be necessary for Arab students and the Haredi Jews if they are to be effectively integrated into the labour market.

These groups are left with multiple disadvantages, as they have little access to VET, do not, through military service, get skills that are sought in the labour market through the army, or benefit from post military service grants. Vocational education and training, given the current needs on the Israeli labour market, could if it were significantly enhanced, play an important role for both Arabs and Haredim in improving access to the labour market.

Too small a sector relative to labour market needs

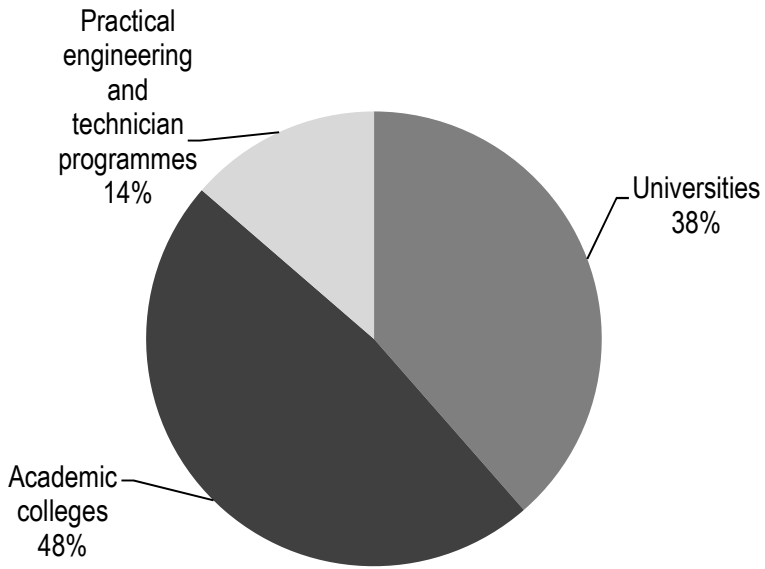
At upper secondary level, about 40% of students enter "technological" vocational tracks but very few receive work-based training. Only 4% complete a dedicated occupational programme and there are only about 1 000 enrolled apprentices. Dedicated, vocational tracks in the Israeli school system were abandoned in the 1970s in favour of a more comprehensive school system, and the remaining technical and vocational elements in high school education were further reduced in scale between 2003 and 2007. Programmes that include work-based learning options are restricted to a narrow range of traditional trades and have low status.

There is a clear hierarchy in the different vocational tracks of secondary education. Vocational tracks in the industrial schools and the schools for apprentices under the Ministry of Economy have been reduced in scale and now only cater for a small minority of students, who have been unsuccessful in the academic and technological tracks. Of the 7% of students that drop out of Ministry of Education schools, 60% will enter Ministry of Economy schools (Yair, Goldstein and Rotem, 2013).

Relatively few people in Israel pursue postsecondary vocational qualifications, beyond secondary level but at a lower level than a bachelor's degree. Almost ten times as many students start full bachelors' degrees than practical engineering and technician programmes (see Figure 2.3).

Figure 2.3 Types of institutions and programmes

First year student enrolments at the beginning of the school year 2011-2012



Note: This chart does not include other type tertiary B programmes than practical engineering programmes (such as teaching training programmes; arts, design and architecture programmes, qualified nurses, among others).

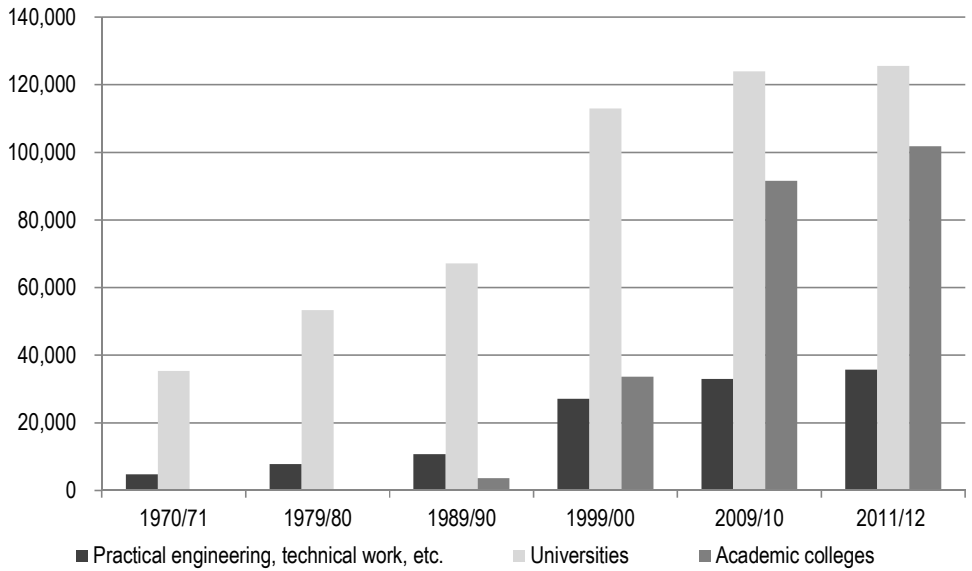
Source: CBS (2013e), "Students in universities, academic colleges, and colleges of education, by degree", Table 8.54, in *CBS - Statistical Abstract for Israel 2013*, Central Bureau of Statistics, Israel, www.cbs.gov.il/reader/shnaton/templ_shnaton.html?num_tab=st08_54&CYear=2013; CBS (2013f), "Students in tertiary type b education, by field of study, year of study, sex and age", Table 8.42, in *CBS - Statistical Abstract for Israel 2013*, Central Bureau of Statistics, Israel, www1.cbs.gov.il/reader/shnaton/templ_shnaton_e.html?num_tab=st08_42&CYear=2013

Postsecondary education has grown very quickly in Israel in the two decades, and the academic colleges[3] have absorbed the bulk of the increase (see Figure 2.4). Academic higher education institutions grew from 21 in 1990 to 66 in 2008, and the number of students tripled (CBS, 2013e). Unlike

academic colleges, colleges for practical engineering and technicians are not part of the Council for Higher Education. For students who finish upper secondary school with a matriculation, the overwhelmingly dominant postsecondary route remains academic bachelors' programmes in a university or in an academic college. Military service typically intervenes between these two experiences, but while many skills are acquired during military service, arrangements for certifying and recognising those skills are inadequate.

Figure 2.4 Evolution of student numbers

Total number of students 1970-1971/ 2011-2012



Note: This chart does not include other type tertiary B programmes than practical engineering programmes (such as teaching training programmes; arts, design and architecture programmes, qualified nurses, among others).

Source: CBS (2013e), "Students in universities, academic colleges, and colleges of education, by degree", Table 8.54, in *CBS - Statistical Abstract for Israel 2013*, Central Bureau of Statistics, Israel, www.cbs.gov.il/reader/shnaton/templ_shnaton.html?num_tab=st08_54&CYear=2013;
CBS (2013f), "Students in tertiary type b education, by field of study, year of study, sex and age", Table 8.42, in *CBS - Statistical Abstract for Israel 2013*, Central Bureau of Statistics, Israel, www1.cbs.gov.il/reader/shnaton/templ_shnaton_e.html?num_tab=st08_42&CYear=2013

In other countries the picture is very different. In the United States around 12% of the labour force has a postsecondary certificate (typically a

one-year degree) as their highest qualification – and certificate graduation rates are burgeoning – tripling in recent years. A further 10% have an associate degree (two-year degree), many of which will be vocational (Kuczera and Field, 2013). Similarly in Canada, around one-quarter of the cohort gains a (typically professional) associate degree as their highest qualification (Human Resources and Skills Development Canada, 2012). In France, in 2010-2011 almost 360 000 students were enrolled in two-year postsecondary VET programmes (*Brevet de technicien supérieur and Diplôme universitaire de technologie*), representing one-third of the students entering postsecondary education (Ministère de l'éducation nationale / Ministère de l'enseignement supérieur et de la recherche, 2013). In Korea, roughly one-third of the youth cohort enters junior college or polytechnic programmes, which are dominated by two-year vocational programmes (Kis and Park, 2012). In Australia in 2011, 260 000 students were enrolled in postsecondary diploma and advanced diploma qualifications, up from 166 000 in 2007 (NCVER, 2012). In Scotland in 2008/9 nearly 17 000 persons graduated with one or two-year higher national certificates and diplomas, compared with 32 000 with bachelor's degrees (Scottish government, 2010). In the very different circumstances of Switzerland around 15% of the cohort graduate through the professional education and training system, through professional colleges and industry-led federal exams (Fazekas and Field, 2013). In some other countries, while postsecondary VET is smaller in scale, it is rapidly growing. In Romania enrolments in "post high school" grew from 44 000 in 2005/6 to 70 000 in 2010/11 (NCDTVET Romania, 2013).

Globally, developed countries display a growing demand for postsecondary qualifications involving less than a bachelor degree, reflecting the fact that some occupations involve more than upper secondary qualifications but less than a bachelor's degrees. On the face of it the Israeli system therefore contains a substantial gap in provision, or alternatively, an over-provision of bachelor degrees for jobs that do not require three full years of training.

Inadequate funding

There has been steady reduction in the budget for vocational education under the Ministry of Education (including technological tracks at the upper secondary level, and the practical engineering programmes): the budget fell by more than one-third between 2003 and 2007, reducing student numbers[4] (Nathanson, Levy and Simanovsky, 2010). Practical engineering and technician programmes are also under great financial strain, particularly those under the Ministry of Economy,[5] with reports of a severe lack of funding for equipment and facilities (Yair, Goldstein and Rotem, 2013). The OECD team heard that the lump-sum funding arrangements make it difficult

for institutions to plan ahead, as they do not know in advance how much money they will receive and it is not directly related to student numbers.

Table 2.1 National expenditure per student, by year

In NIS

	2000	2003	2005	2008	2011		
	Total	Total	Total	Total	Public	Private	Total
Pre-primary	11 800	12 600	13 500	15 100	13000	3 000	16 000
Primary	15 400	16 600	17 700	20 400	21000	1 000	22 000
Secondary	19 200	19 800	20 700	25 300	20000	7 000	27 000
Postsecondary VET	23 300	21 700	20 900	19 200	8000	12 000	20 000
Higher education	39 700	40 100	39 400	46 200	40000	11 000	51 000

Notes: In the table postsecondary VET includes all "non-academic tertiary education institutions: technological colleges, regional colleges, kindergarten and teacher training colleges etc.; institutions that received recognition as institutions of higher education are excluded."

Including expenditures on educational services in educational institutions and additional expenses of households – including private lessons, and excluding textbooks and stationery purchased by households, including calculated estimate of expenditure for consumption of fixed capital and equipment.

Source: Ministry of Education (2012), The Education System in the 2012/2013 School Year, Ministry of Education - Economy and Budgets Directorate, http://cms.education.gov.il/NR/rdonlyres/38CAE988-AC9B-4A4F-9AC1-118C6B5EB279/158894/2013.pdf

Table 2.1 shows the decrease of expenditure in postsecondary VET programmes throughout the years. The data available are not precise enough to see how practical engineering programmes are affected but it gives an interesting snapshot of the evolution of the funding over the last decade. 2011 data show that for private households, it is more expensive to attend these VET courses than academic higher education.

OECD (2010) reports a significant decline in public expenditure on vocational training since 2002 and changes in legislation that made eligibility for unemployment benefit stricter. Benefits of those who study in vocational courses were reduced by 30%, and as a result, in 2005 only 1.6% of unemployment benefit recipients participated in vocational training, down from 14% prior to the spending cuts. Israel is among ten OECD countries spending the least on vocational training for the unemployed.

The level of state funding per student (in comparable fields) is lower in practical engineering programmes than in (academic) engineering programmes in universities: in colleges under the Ministry of Economy, the average governmental spending per student is NIS 8 500 and NIS 6370 in those under the Ministry of Education, compared with NIS 27 500 in academic engineering programmes in university. Some financial aid is available,[6] but it varies between the two different frameworks. There is no government funding for the technician tracks (MOITAL, 2012).

Across OECD countries, public funding for postsecondary vocational programmes is quite a complex mix with varying arrangements for public support for tuition (see Box 2.2). The economic benefits of vocational training are often shared, with some benefits going to the trained person as higher wages, some to employers in the sectors that extract more profit from a better trained workforce, and some to society at large that gains from economic growth. Against that background postsecondary vocational programmes are often (at least partly) funded by the public purse. There is no obvious reason why the amount of public spending seems low relatively speaking in Israel, why the number of unemployed people undertaking training fell, and why public subsidies are absent from technician programmes.

Box 2.2 Funding arrangements in postsecondary VET

In the United States private institutions receive no direct public funding and therefore rely mainly on tuition and fees paid by students. In 2010-11 in one U.S. state the mean amount charged to a full-time student by private for-profit postsecondary vocational institutions was USD 14 117, six times more than in comparable public providers.

Similarly in Korea, while postsecondary VET is provided at no or small cost in public institutions it can be substantial in private providers.

In Denmark, postsecondary VET includes regular full-time programmes mainly for young people and parallel programmes often provided in a part-time mode for adults. They enrol 83% and 17% of VET students respectively. While regular VET is provided by public institutions at no fee to students, postsecondary VET programmes for adults at public or private providers involve fees with the fee level being set by individual institutions. As in Sweden, private providers in Denmark receive the same level of funding and operate according to the same rules as public institutions.

Box 2.2 Funding arrangements in postsecondary VET (*continued*)

Public funding of postsecondary VET in England and Wales depends on the level of qualification, the age of the participant and the purpose of studies (first degree or retraining). Programmes for young people (19-24 year-olds) are either free of charge or co-funded by the government whereas individuals who are 24 and older cover the full cost of the provision. To facilitate access of these individuals to education and training the government makes available income contingent loans (graduates do not repay the debt unless their earnings are at or above the threshold level).

Source: Kuczera, M. and S. Field (2013), *A Skills beyond School Review of the United States*, OECD Reviews of Vocational Education and Training, OECD Publishing, Paris, doi: http://dx.doi.org/10.1787/9789264202153-en; Kis, V. and E. Park (2012), *A Skills beyond School Review of Korea*, OECD Reviews of Vocational Education and Training, OECD Publishing, Paris, doi: http://dx.doi.org/10.1787/9789264179806-en ; Field, S., et al. (2012), *A Skills beyond School Review of Denmark*, OECD Reviews of Vocational Education and Training, OECD Publishing, Paris, doi: http://dx.doi.org/10.1787/9789264173668-en ; Musset, P. and S. Field (2013), *A Skills beyond School Review of England*, OECD Reviews of Vocational Education and Training, OECD Publishing, Paris, doi: http://dx.doi.org/10.1787/9789264203594-en.

Recommendation: Decisive action to develop vocational education and training in Israel

In the face of serious and growing skills shortages, exacerbated by demographic change, take decisive action, supported by adequate funding, to launch a strategic expansion of high quality vocational education and training programmes, guided by partnership with industry, and underpinned by legislation. Make the vocational skills learnt during the military service more transparent and transferable.

Supporting arguments

There are two supporting arguments. First, this chapter sets out a strategic objective and argues for its foundation in legislation. Later chapters provide an interconnected and mutually reinforcing package of measures designed to implement the strategy, particularly at postsecondary level. Chapter 3 argues for the creation of a strategic body to steer the system. Chapter 4 proposes the systematic integration of work-based learning into vocational programmes. Chapter 5 argues for a strengthening of career progression pathways for graduates of VET programmes. Chapter 6 recommends developing the teaching workforce in VET programmes and

ensuring quality. All of this echoes a widely held view in Israel that "youth vocational and training should be aggressively promoted" (Nathanson, Levy and Simanovsky, 2010, p.9). Second, it argues that skills learnt during military service should be made more transparent and transferable.

While this review is primarily concerned with postsecondary VET, the same arguments also apply to the upper secondary VET system and might also involve the development of an apprenticeship system.

Taking legislative measures to strengthen the system

To give both impetus and clarity to the strategy it needs a clear legal and institutional basis. Currently postsecondary programmes cannot be "championed" by a particular ministry or agency (as technological tracks are by the Ministry of Education, and vocational courses by the Ministry of Economy, or the universities and academic colleges by the Council for Higher Education.). Postsecondary VET programmes are defined as being grade 13 and 14 (this is especially the case of those under the Ministry of Education), often appearing as no more than an "add on" of upper secondary education. This contrasts to the arrangements in many other countries where programmes are embodied in a well-defined set of programmes or institutions that typically provide a visible definition for the sector. For example, community colleges and associate degrees in the United States, TAFE institutions in Australia, professional colleges in Switzerland, *Fachschulen* in Germany, academies and university colleges in Denmark.

Legislation would also provide a statutory basis to the partnership with industry stakeholders embodied in the strategic body which will be proposed in Chapter 3.

Recognising and certifying skills acquired during military service

As many as 15% of soldiers learn high-end technical skills during military service (Lotan, 2010). This seems to be particularly the case of soldiers from disadvantaged backgrounds. The injection of these skills into the civilian economy may have contributed significantly to Israel's high-tech take-off in the early 1990s (Offenhauer, 2008) but despite apparent success, vocational skills learnt in the army are often not formally accredited and therefore recognised by employers, meaning that there are some wasted opportunities.

The development of RPL (Recognition of Prior Learning) mechanisms targeting discharged soldiers from the army could make the skills they have acquired more transparent and transferable and encourage further learning. Processes that certify existing skills and knowledge allow making skills

visible to other actors, such as employers and education and training institutions. It has numerous potential benefits:[7]

- Through course exemptions it reduces the direct and opportunity costs of formal learning.
- It improves the efficiency of the labour market, by making acquired skills transparent.
- It helps adults with limited formal education to re-enter education and advance their careers.
- It rewards and therefore encourages learning in informal settings (Field et al., 2012).

Another option would be to create "dual" qualifications building on the training received in the army and integrating it into an educational qualification (some possibilities exist in a small number of technical fields, in particular in the regulated trades). Similar possibilities exist in some OECD countries: in Flanders the development of a qualifications framework should make qualifications equivalent regardless of where the students have been taught – in a centre for adult education, a university college, or even a training programme from an employment centre (see Musset, 2013). Israel would benefit from a comparable approach, allowing skills learnt in different settings (including the IDF) to be assembled into qualifications, recognised on the labour market.

Notes

1. Some caution should be taken while analysing these data as it may not take into account that many 16-24 year-olds are in the military service.
2. To date Haredi men have essentially been absolved from military service via rules granting exemptions if they remain in full-time (religious) education. Landmark legislation is in the pipeline that will see a major reduction in the scope of these exemptions. The Ministry of Economy intends to follow this legislation with a substantial programme of active measures to encourage Haredi men to join the labour force (OECD, 2013b).

3. Academic colleges were created in 1958 through the Higher Education Council Act, in respond to increasing demand for higher education from students that did not qualify to university studies. These colleges offer bachelor degrees. Some of these colleges are funded by the state and the tuition is at university level, while others are private and tuition fees are higher. The distinction between universities and academic colleges is very marked, with research-intensive universities and colleges that offer mainly bachelor's degrees and to a lesser extent masters' degrees.

4. According to data from the Ministry of Education, it seems that the total national expenditure per student decreased by 12% from 2003 to 2008 for programmes under the Ministry of Education. As the number of students remained fairly constant in that framework, it may be that the bulk of the cutbacks affected the Ministry of Economy programmes.

5. The Ministry of Education awards funding based on student enrolment, whereas the Ministry of Economy awards lump-sum funding.

6. The Ministry of Defence provides stipends at 90% of the tuition fees for students in the preparatory course and the first year of studies. Ultra-Orthodox Jewish men and Bedouin students can receive specific financial support, covering tuition fees and, in the case of Bedouins, a living allowance. Additional scholarships from private foundations are also available. Engineering colleges under the Ministry of Education provide assistance grants for disadvantaged students.

7. There are also some barriers to its effective use. Education institutions and professionals are often unwilling to accept that competences can be acquired in different learning contexts, and even informally, while employers are sometimes reluctant to make the skills of their own employees too transparent for fear of poaching. Assessing prior learning is also a significant challenge since informal learning is almost by definition undocumented. Credible and professional assessment of skills itself consumes resources.

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Chapter 3

Strengthening co-ordination and social partner engagement

In Israel the different parts of the vocational education and training (VET) system are subject to uncoordinated governance systems. This makes the system difficult to navigate for students, and inhibits social partner engagement. It is extremely important that the social partners, in particular employers, are fully involved in VET, partly because they are in the strongest position to know what skills are required by their employees, and partly because if training provision is largely funded from the public purse, it should reflect the larger interests of society, including labour market actors as well as the interests of students.

In the face of these challenges, this chapter recommends the establishment of a co-ordination body to drive the strategic development of the VET system in Israel, along the lines of other OECD countries.

Challenge: A fragmented system which is both inefficient and an obstacle to industry engagement

The governance of VET in Israel is subject to two major challenges. First, it is highly fragmented, particularly in the division between the responsibilities of the Ministry of Economy and the Ministry of Education. Second, partly because of this fragmentation, but also for other reasons, employers and organised labour are not sufficiently involved in the VET system.

The system is fragmented

In Israel different strands of the VET system are subject to different and uncoordinated governance arrangements, mainly divided between the Ministry of Economy and the Ministry of Education. Other ministries, such as the Ministry of Tourism, the Ministry of Agriculture, have their own set of programmes, although at a smaller scale.

For example, the technician and practical engineering programmes under the Ministry of Economy are administered by the MAHAT, the National Institute for Technical Training. This institute accredits colleges and prepares examinations. But a separate but similar set of programmes (in similar fields) is under the Ministry of Education, and the Science and Technology Administration administers the content of the programmes and the examinations. Therefore each of these ministries has separate bodies undertaking parallel tasks of curriculum design, supervision and management, quality assurance, and granting diplomas. Such duplication is both wasteful and fragmenting. There is no particular educational rationale behind this division, which has long historical roots. In 1953 responsibility for vocational schools was placed with the Ministry of Economy but in 1961 the administration of upper secondary VET was returned to the Ministry of Education, while the Ministry of Economy maintained control over a few schools (Vergon and Natan, 2008). Practical engineering and technician programmes followed the same pattern.

Many observers of the Israeli VET system have argued that the relationship between the two main ministries with responsibilities for vocational programmes should be less competitive and more collaborative (Yair, Goldstein and Rotem, 2013). A report of the State Comptroller (State Comptroller of Israel, 2010) describes the lack of co-operation between the two entities as “severely dysfunctional”. Due to differences in funding mechanisms, few students transfer from Ministry of Education institutions to Ministry of Economy ones: because schools are funded based on enrolment numbers, schools risks losing funds if they direct their students elsewhere

(Yair, Goldstein and Rotem, 2013). It also makes it difficult for institutions to plan ahead, as they often have to operate under different frameworks simultaneously and fall under both ministries, and this also multiplies administrative costs).

Managing fragmented systems and programmes to deliver strategic coherence and co-ordination while sustaining diversity and innovation is a major challenge for many countries, especially for vocational programmes because of the additional need to engage social partners with their different agendas (see Musset at al., 2013 for Austria, Kis and Park, 2012 for Korea). Fragmentation also causes unclarity for potential and actual students in the face of multiple pathways and sometimes competing offers.

Fragmentation hinders employer engagement and undermines their familiarity with qualifications

The duplication of programmes in various sets (such as the technicians and practical engineering programmes, under the Ministry of Education and under the Ministry of Economy) makes it less likely that employers will see the programmes as "their programmes" and to engage in the definition of curricula – because they would have to do so twice over.

At the national level, while employers work informally with the Ministry of Economy to develop and update the curricula of vocational programmes, there are no systematic consultation mechanisms. Locally, institutions providing VET have weak connections with companies. The weakness of employer engagement would be less worrying if VET graduates had a smooth transition into the labour market. According to available data from an unrepresentative survey, 74% of those who participated in vocational courses were employed five years after completion, with 40% of them working in an occupation for which they were trained, 12% were unemployed and 14% were outside the labour market. In some fields of VET, the labour market outcomes of graduates are worse if they work in the fields in which they have been trained, than if they work in another field (MOITAL, 2012) suggesting that the programmes may not be well targeted on labour market needs. If provision is not shaped by labour market needs, it will be more likely to reflect the capacity of VET institutions (often biased towards existing and cheaper programmes and towards the skills of existing teachers) and student preferences based on limited information.

The Ministry of Economy is very much aware that employers need to be more engaged and the Israeli background report itself assesses employer's involvement in funding, curriculum development and work-based learning as weak (MOITAL, 2012). The social partners – both employers and unions – are well-organised and it is very clear from their discussions with the

OECD team that they are keen to engage more fully with the vocational education and training system. This is a key strength on which to build.

As they fall under different ministries and different frameworks, practical engineering and technician programmes in the same fields may vary significantly, while leading to different formal qualifications. The function of a vocational qualification is to convey information – that a qualified person has a package of knowledge and skills relevant to a particular occupation or career. Fragmentation makes the function and value of different qualifications unclear (see Musset and Field, 2013, for an analysis of the issue in the English context).

Recommendation: A new body to engage stakeholders and drive strategy

Establish a national body involving all the key stakeholders, include the ministries, employers and unions, to provide strategic guidance on the development of the VET system.

Supporting arguments

This recommendation is supported by four arguments. First, such a body is necessary to support the strategic development of the system and will fulfil a number of specific functions. Second, engaging employers is key to a good VET system. Third, the influence of different stakeholders needs to be balanced. Fourth, such an initiative would receive wide support in Israel.

A body to support strategic development

The body should include relevant ministries, the social partners, the IDF, representatives from the main institution networks and key providers and have responsibility for giving policy advice to government, and to ensure more strategic co-ordination of the VET system. It should cover both postsecondary and upper secondary vocational programmes as well as programmes offered for adults by different ministries to ensure co-ordination between the sectors, and a more seamless transition from upper secondary to postsecondary levels for students (see Chapter 5 for more on this issue). Some current structures that already exist, in particular the recently created Practical Engineering and Technician Council,[1] should be incorporated into this one joint body (Knesset, 2012). The body would therefore provide key support for strategic expansion of the sector (see Chapter 2, and Karmi, 2004). Stronger social partner involvement will help to support other reforms, including those recommended in the following

chapters of this report – enhancing work-based learning (see Chapter 4), improving student transitions (see Chapter 5) among others.

While the most fundamental role of the body would be to better involve employers in VET policy, it would also create a bridge between the Ministry of Economy and the Ministry of Education and provide the incentives for them to work together, in drawing up a co-ordinated policy for technical education and vocational training in secondary schools and training for young technicians, practical engineers and adults. It would also bridge them with the other ministries involved in training. As argued in Chapter 2, the body should have a statuary basis, backed by legislation.

Such a body would address issues such as:

- Fostering consolidation when synergies and economies of scale are possible. One of the paradoxes of the Israeli system is that there are a relatively large number of institutions for a relatively small number of students. One option could be to put both types of practical engineering and technicians programmes (the ones under the Ministry of Economy and the ones under the Ministry of Education) in the same institutions and frameworks (without closing necessarily any site). It would make it easier to "champion" these programmes and give the system a stronger institutional basis. In Denmark for example, nine academies of professional higher education were created in 2008, by re-organising the 70 former vocational schools into larger multi-campuses institutions. These institutions offer programmes in a wide range of commerce, technical and service professions. To some extent the success of these institutions and their programmes reflects the economies of scale and synergies arising from the amalgamation of single-profession training institutions, but also, relative to universities, to the possession of distinctive missions, focused on professional education, which are clearly different from universities (Field, et al., 2012).
- Establishing a common system and framework of qualifications. Currently, the different ministries (of education, and of economy, but also of defence, of tourism, of agriculture) each have their own set of qualifications.
- Secure and earmark funds for postsecondary VET.
- Plan the development of more practical engineering and technician programmes, to match demand: One option to provide growth in this sector would be to allow academic colleges to offer these programmes. (By law tertiary education institutions such as

university and community colleges cannot offer both higher education and VET courses.)

- Improve articulation and transitions from upper secondary VET to postsecondary programmes and from postsecondary VET to academic bachelor programmes (see Chapter 5).
- Pursue reform of teacher preparation arrangements (see Chapter 6).

Engaging employers is key to a good VET system

Many other OECD countries often maintain co-ordination bodies designed to provide an overall steer for the VET system (see Box 3.1). The frameworks in Denmark and Switzerland build on strong industrial bodies (employer organisations and trade unions) and a long tradition of engagement in VET. The industry-led UK Commission for Education and Skills (UKCES) involves high profile representatives of large and small employers (including CEOs of large companies), as well as other stakeholders.

Box 3.1 National strategic bodies steering VET policy

In Denmark the Council of Academy Profession Programmes and Professional Bachelor Programmes (i.e. short and medium cycle postsecondary VET) was set up in 2008. The board has up to 21 members, including those appointed by the Minister of Science, Innovation and Higher Education after nomination by various employer organisations (8 members), trade unions (2), the organisation of Danish regions (1), organisation of local governments (2), student organisations (2), university colleges (1) and academies of professional higher education (1). The Council meets six times a year and advises the Minister about the development of new programmes, the mix of provision, quality assurance and improvement. It also provides a yearly report, which reviews existing programmes and describes new initiatives.

In Switzerland, the involvement of professional organisations in VET policy making is required by law. The term "professional organisations" in Switzerland refers to trade associations, employer associations and trade unions, and includes both companies and business people. Professional organisations have the leading role in the content and examination process of both secondary and postsecondary VET programmes (in Switzerland postsecondary VET is referred to as "professional education and training", PET).

Box 3.1 National strategic bodies steering VET policy (*continued*)

Professional organisations in postsecondary VET, as in secondary level VET, draft core curricula for PET college degree programmes, which are then approved by the Swiss authorities (Confederation). National examinations leading to a federal diploma are also led by professional organisations. They ensure those federal PET diplomas are relevant to the needs of the profession and the labour market. Professional organisations draft examination rules, which cover admission requirements, occupational profiles, the knowledge and skills to be acquired, qualification procedures and the legally protected title. They also conduct examinations. The role of Swiss authorities (at Confederation level) includes approving examination rules, supervising examinations and issuing federal diplomas.

In the United Kingdom, the UK Commission for Employment and Skills (UKCES) was launched in April 2008 with the aim of increasing the employer voice in the United Kingdom's VET system and promoting investment in skills to drive enterprise, jobs and growth. It is led by commissioners from large and small employers, trade unions and the voluntary sector. It also includes representatives of further and higher education institutions and from the Devolved Administrations. Its strategic objectives are: *i)* to provide world-class labour market intelligence which helps businesses and people make the best choices for them; *ii*) to work with sectors and business leaders to develop and deliver the best solutions to generate greater employer investment in skills; and *iii)* to maximise the impact of changed employment and skills policies and employer behaviour to help drive jobs, growth and an internationally competitive skills base. The UKCES also funds and manages the Sector Skills Councils and oversees their relicensing process.

A recent shift in the approach to employer engagement encourages employers to own their skills agenda and develop their own initiatives, rather than relying on a policy agenda set by government with incentives for employers to join in. In 2011 the UK Prime Minister announced a fund of up to GBP 250 million to test out approaches that empower employers to take control of skills development. The UKCES is working closely with government to develop this approach.

Source: Staatssekretariat für Bildung, Forschung und Innovation (SBFI) (2013), SBFI website, www.bbt.admin.ch, accessed January 2013; UK Commission for Employment and Skills (UKCES) (2013), UKCES website, www.ukces.org.uk, accessed January 2013; OPET (Federal Office for Professional Education and Technology), (2011), *Facts and Figures. Vocational and Professional Education and Training in Switzerland*; Danish Agency for Higher Education and Educational Support (2012), *Skills beyond School: OECD Review of Post-Secondary Vocational Education and Training – National Background Report for Denmark*, http://fivu.dk/en/publications/2012/oecd-review-skills-beyond-school-2013-national-background-report-for-denmark

Co-ordination balances the influence of different stakeholders

There needs to be a balance between the influence of different stakeholders – employers, trade unions and the government. An important role for the government is to take into account the perspective of employers and unions in policy development and, at the same time, support the interest of students. While employers have an essential role in articulating skills needs, they may be interested in investing in a narrower skill set than that which would be in the interest of students and society as whole (to allow students to have skills that are relevant not only for one employer). Employers as a whole have a very strong interest in general transferable skills, including literacy, numeracy and soft skills, while individual employers and sectoral groupings often have narrower interests. Trade unions can usefully balance the influence of employers voicing the students and the employees' interests (OECD, 2010).

The lack of stakeholder engagement and VET programmes of limited labour market relevance can be mutually reinforcing. But it is possible to break this vicious cycle and turn it into a virtuous one. In a virtuous cycle the VET system provides high quality programmes that are relevant to labour market needs, and as a result employers come to perceive the VET system as a source of well-trained recruits. This in turn helps sustain the quality of the VET system, as policies and programmes can be designed to meet labour market needs. The resulting quality of VET graduates sustains and improves employer confidence and engagement.

Support for a new body from the stakeholders

The Harari commission (Karmi, 2004) concluded that in the face of multiple challenges, a "forum" bringing the different VET stakeholders together is necessary. Nathanson, Levy and Simanovsky (2010) recommend a similar solution. The interviews conducted during the review visits with a wide range of stakeholders confirm widespread support for such a body. This echoes the proposal of the Manufacturers' Association to create a public authority for vocational education with responsibilities for setting strategies and operational plans, promoting research, suggesting education methods and to improve the public image of vocational education (Lotan, 2010).

Notes

1. In 2012, the Qualified Practical Engineers and Technician Act legislated the creation of a "Practical Engineers and Technician Council", composed of different stakeholders. The Council is not yet operational (Knesset, 2012).

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Chapter 4

Building an effective framework of work-based learning

Across OECD countries, the biggest challenge facing vocational education and training (VET) is to ensure that programmes fit the needs of the workplace. It should be no surprise that one key means of achieving that objective is to deliver vocational training in the workplace. But despite obvious and compelling arguments in its favour, work-based learning is too often neglected, partly because education and training organisations find it easier to work on their own without having to involve employers, and partly because employers do not recognise the potential returns from offering work placements to students. Many of these challenges are salient in Israel.

In response, this chapter argues that work-based learning should be introduced as a systematic, mandatory, quality-assured and credit-bearing element of vocational programmes. Such an approach would not only ensure a very strong learning environment, but also link provision much more effectively to a partnership with employers.

Challenge: Despite all the benefits, work-based learning plays a very small role in VET

There are three main challenges. First, work-based learning provides a hugely important learning environment. Second, it is neglected in Israel. Third, to be effective, work-based learning requires a clear framework.

Why work-based learning is important

Work-based learning as a component of vocational programmes takes many forms, ranging from short internships to much more substantial placements including full apprenticeships, with large proportions of the study time spent in the workplace. For vocational programmes at postsecondary level the issues are different, but not fundamentally so. When students are older and have some work experience, or indeed have current jobs, the role of work-based learning in introducing people to the world of work, and transitioning them into jobs, is no longer so critical (although often still very relevant). But work-based learning is, or should be, lifelong learning, with a vital role to play not only in initial learning of occupational skills, but also in continuous professional development, deepening and broadening professional knowledge and skills, as well as allowing for sideways career moves. The many benefits of work-based learning, set out in OECD (2010), are therefore similar to the benefits realised in the context of postsecondary programmes, although with different priorities and nuances. These benefits include:

- *For students, a strong learning environment.* Work-based learning offers real on-the-job experience and makes it easier to acquire practical skills on up-to-date equipment and with trainers, and alongside workers familiar with the most recent technologies and working methods. Soft skills such as dealing with customers are also more effectively learnt in workplaces than in classrooms and simulated work environments.
- *For both students and employers, it signals that a vocational programme is of labour market value*. Employer willingness to offer workplace training places is an indicator of their support for the associated vocational programme.
- *For both students and employers, an effective route to recruitment.* In the workplace, employers and trainees get to see each other for what they are, when under pressure, and when there is conflict. Since other potential employers cannot readily observe these

characteristics, an employer taking trainees is in a position to recruit the best among them (Acemoglu and Pischke, 1998; 1999).

- *For employers, a productive benefit.* This is particularly important in the case of apprenticeships (Schweri et al., 2003; Mühlemann et al., 2007), but is also possible in more substantial work placements where trainees have the time to master productive skills.
- *For public authorities, value for money.* Delivering vocational programmes outside the workplace can be very expensive, particularly in fields where modern equipment is expensive and requires continuous updating, and where expert practitioners command substantial salaries.

Work-based learning in Israel

In Israel, 38% of upper-secondary students are enrolled in technological and vocational paths but only 4% of them receive training with employers during their studies (OECD, 2013). This contrasts with apprenticeship systems, but also with many other forms of vocational training – for example in the Netherlands, in the upper secondary school-based vocational MBO system around one-third of study time takes place in the workplace (Fazekas and Litjens, forthcoming). At postsecondary level work-based learning is equally rare (MOITAL, 2012).

In Israel the government contributes to the cost of employer-specific training where it leads to employment of the trained person or increases the overall employment level. Under the "On the Job Training" programme a new recruit/trainee is employed full-time and receives the minimum wage, with training provided by an instructor assigned from the company staff. If the new recruit/trainee is employed for at least 12 months (including the training period) the employer is reimbursed for the cost of training and part of the wage costs. In the framework of "A class in the Workplace", the state pays for courses designed to meet employer needs, while in exchange the employer must ensure that at least 65% of graduates find employment. The training is employer-specific but must meet certain minimum requirements (MOITAL, 2012). Participation of employers in this type of training is limited, apparently because of low perceived benefits compared to the cost of training (MOITAL 2012).

Given a relatively limited vocational system overall, job-related skills are commonly developed informally on the job, while formal education concentrates on general knowledge and competencies. But as skills shortages are widely reported by Israeli employers this model may not be sufficient to meet demand.

There is no systematic framework for work-based learning

Where work-based learning does take place, it depends on local *ad hoc* arrangements between specific postsecondary institutions and local industry. As a result some students are much more likely to receive practical training in an authentic work environment than others. This contributes to differences in quality across postsecondary VET programmes and to an unequal distribution of benefits from work-based learning.

In the absence of a formal framework setting out the rights and obligations of employers and students, and where work-based learning is not awarded with credits, it is unclear what students should be learning from their work-based experience, how this knowledge might be assessed, and indeed how the whole experience might be quality assured. The lack of such a framework has been associated in some countries with poor quality work-based learning during which students are treated as unqualified and cheap labour (Kuczera, Kis and Wurzburg, 2009).

Recommendation: Mandatory work-based learning

Integrate work-based learning systematically into postsecondary vocational programmes, as a mandatory, quality-assured and credit-bearing element. Establish a regulatory framework in support of this end.

Supporting arguments

Six arguments support this recommendation. First, mandatory work-based learning organised according to common principles will improve the quality and status of postsecondary VET. Second, mandatory work-based learning enhances partnerships between VET institutions and local employers. Third, international experience shows that the introduction of mandatory work-based learning is feasible. Fourth, a well-structured framework that promotes social partners involvement in VET, defines funding responsibilities, and assists companies with provision of training will facilitate implementation of work-based learning. Fifth, intermediary bodies can be helpful in developing work-based learning in small companies. Sixth, strong labour market demand for skills provide a favourable context for the introduction of work-based learning in Israel.

Mandatory work-based learning supported by a common set of principles

Systematic work-based learning would realise many benefits as discussed at the outset of this chapter. This requires a number of steps. First

it needs to be made a mandatory integrated element of the vocational programme, rather than an optional add-on. As a mandatory element, it can be linked to a definition of the learning outcomes expected of work-based learning, outcomes which in turn can be assessed, and grant credit to the student. This framework then provides the basis of quality assurance, since the training enterprise, in combination with the student becomes responsible for delivery of the learning outcomes. In recognition of these obligations, the framework may also involve a contract between students and training enterprises.

Regulation ensures that training complies with minimum quality requirements, with requirements to cover the content and duration of training, the assessment of training outcomes and trainers' qualifications. Work-based learning can involve various tasks, such as students carrying out tasks typically performed by skilled employees or students doing a project on a specific aspect of a company activity. Quality standards help to avoid the allocation of students to unskilled tasks and ensure students are learning useful occupational skills.

Rather than a bureaucratic obstacle quality assurance may take the form of supportive measures for employers. The *QualiCarte* project in Switzerland provides an example of a tool that supports employers in improving their training for apprentices. Developed with the social partners, the *QualiCarte* provides a checklist of 28 quality criteria describing key aspects of workplace training including the engagement of the company, particular aspects of the initial phase of the training and the subsequent training process. These criteria are used by companies for self-assessment (OECD, 2010).

Work-based learning enhances partnerships between training providers and local employers

Many institutions tend to operate in silos, and education and training institutions are no exception. Reaching out to employers means breaking out of these silos and overcoming a natural resistance on the part of classroom teachers to the idea that students can learn much in the workplace that they cannot learn so readily in the class room. So institutions need strong incentives to establish the partnerships with employers that facilitate an effective workplace learning element in programmes. Employers also need incentives. Sometimes employers believe (often wrongly) that offering work placements is an unnecessary cost, that they can reasonably avoid, while still benefiting by recruiting from the graduates of a vocational programme.

Against this background, making work placements mandatory can operate as a game-changer. It means that programmes will only be funded

when training institutions develop and maintain the active partnerships that support work placements. Under these conditions training providers will see employer partnerships as central to their mission, while employers will see that, unless they are willing to offer work placements, the programme from which they draw their recruits may close or contract, and government funding shift to another sector, or another region. This gives employers a desirable influence over the mix of training provision, allied with the principle that the greatest influence goes to those employers that are prepared to contribute most, by way of the offer of work placements.

The establishment of such partnerships linked to workplace learning would not only yield significant learning benefits to students, but also wider benefits. Partnership with employers would encourage a mix of provision reflecting labour market needs, help to familiarise employers with vocational programmes and qualifications, and help teachers of vocational subjects to keep up-to-date. Collectively this should help to build a new culture of partnerships with employers in the delivery of vocational education and training, a culture which is found in the world's strongest skills systems.

A historical review of VET in Spain (Homs, 2007) has argued that the reform that made workplace training systematic and mandatory in VET programmes had a positive impact: it ended the isolation of VET institutions and improved the school-company relationships, helped VET teachers to be in contact with companies and facilitated the transition of VET graduates to jobs.

Systematic work-based learning should also benefit VET teachers in postsecondary VET institutions by allowing them to maintain contact with companies and sustain familiarity with their requirements. In Israel VET institutions might find it easier to recruit part timers or temporary teachers among employees of companies with which they co-operate closely (see Chapter 6).

Learning from other countries

Recognising the benefits of work-based learning, some countries make extensive use of such training in postsecondary VET, often in the form of fixed "blocks" such as three-month internships. In Sweden workplace training is obligatory in two-year postsecondary VET programmes and represents one-quarter of the programme duration (Kuczera 2013a). In Denmark the duration of the workplace training is a minimum of three months in two-year postsecondary VET programmes (professional academy) and a minimum of six months in three-year professional bachelor programmes and it can take place at one or several companies (Field et al.,

2012). In Belgium Flanders, vocational programmes targeting the unemployed and run by the Flemish Employment and Vocational Training Agency (VDAB) include obligatory work-based learning in a company that is alternated with periods in learning centres. The period of training with employers is up to a maximum 50% of the total duration of the programme (Flemish Ministry of Education and Training, 2009).

A well-defined framework is vital

The transition from occasional and patchy provision to systematic and mandatory work-based learning is always a challenge. As a first step, empowering of social partners including employers and trade unions[1] is critical. Sweden has recently introduced a postsecondary VET programme with mandatory work-based learning (see Box 4.1). This would not be possible without involvement of social partners in the process.

Box 4.1 Introduction of postsecondary VET with mandatory work-based training in Sweden

In Sweden, social partners have until very recently had little involvement in vocational programmes at any level, although in the last five years government reforms have sought to increase employer engagement. Vocational education and training has in the past been provided mainly by schools and in schools, with little input and involvement from employers and unions. Against that background the higher vocational programmes represent a striking innovation.

The National Agency for Higher VET is responsible for the overall supervision of the sector. The social partners are part of a council that advises the Agency on the future demand for skills and on how this might be met through postsecondary VET provision. This arrangement ensures that only programmes receiving the strongest support from employers are provided. This structure builds partnerships with employers into the design of the system, since it is only possible to seek funding for a postsecondary VET programme when a partnership with employers willing to offer the workplace training is already in place. By law each postsecondary VET programme in every institution should have a steering group including employers.

The framework for postsecondary VET also defines financial responsibility for work-based learning. Its cost, including the cost of releasing an employee to instruct students and the cost of the material that could be damaged during the training, is covered by the employer. On the benefits side, employers receive extra input from a partly qualified workforce at a low cost as students are not paid during the training period. Through work placements employers can also identify the most promising potential recruits.

Source: Kuczera M. (2013a), *A Skills beyond School Commentary on Sweden*, OECD Reviews of Vocational Education and Training, OECD, www.oecd.org/edu/skills-beyond school/ASkillsBeyondSchoolCommentaryOnSweden.pdf

Funding arrangements also affect the amount and mix of training provided. For example employers might be unwilling to pay for courses covering mathematics and languages skills – generic skills benefiting students but not necessarily individual employers. Conversely, students might be reluctant to pay for very narrow company specific competencies. The distribution of funding responsibilities between government, student and employer should ideally reflect the distribution of benefits. Following this principle, employers typically contribute to work-based learning in kind by providing facilities and by releasing and training employees who will train and supervise students. In apprenticeships employers also often provide a modest wage or allowance to students. On the other hand, government and students cover the cost of off-the-job training during which students acquire generic skills and vocational theory – skills and knowledge easily transferable across employers.

Assisting companies with the provision of work-based learning

The delivery of work-based learning involves additional administrative and financial burdens for companies, which may be real obstacles when employers have no experience with training of students and when the benefits of training may appear distant. SMEs face particular challenges as they often lack the administrative and managerial capacity to deal with additional tasks related to provision of training and the financial resources to invest for long term benefits. This could also be a challenge in Israel, where enterprises that employ less than 100 workers represent over 99% of Israel's businesses, account for 55% of the country's workforce and for 45% of its GNP (Kane 2012).

International experience offers a number of policy ideas and tools to encourage companies to offer work-based learning and minimise the cost of training provision. Specific bodies that group and co-ordinate training activities are one of them (see Box 4.2). While these bodies can provide services to all companies, SMEs might benefit most from their support. (The box below describes policy tools helping companies with provision of apprenticeship but many similar tools could be adapted to other forms of training).

Box 4.2 Bodies assisting companies, particularly SMEs, with apprenticeships and other forms of work-based training

Scotland

Scotland has a unique arrangement of intermediary bodies funded by the government that manage postsecondary apprenticeship on behalf of employers. These bodies handle administrative work, ensure the training meets the standards defined in the Scottish vocational qualification system, take responsibility for the assessment of knowledge and skills of apprentices and match candidates for apprenticeships with employers.

Norway

Training offices (*opplæringskontor*) are owned by companies and usually concern specific trades. They work actively to identify potential training companies and establish new apprenticeship places, supervise companies with apprentices, and train staff involved in the tutoring of apprentices. Many training offices organise the theoretical part of the apprentices' training. They often sign the apprenticeship contracts on behalf of smaller training enterprises, thereby becoming accountable for completion of the training and its results.

Australia

Group training organisations (GTOs) are not-for-profit organisations supported by public authorities, with some charges to host employers. The role of GTOs is to employ apprentices and hire them out to host employers. They sometimes focus on a particular industry or region. The tasks performed by GTOs include:

- Selecting apprentices to suit the needs of employers.
- Arranging and monitoring training both on and off the job.
- Taking care of the administrative duties involved.
- Ensuring that apprentices receive a broad range of training experience (if necessary, apprentices are rotated from business to business).

Source: Department of Education, Employment and Workplace Relations (DEEWR) (2011), training.com.au website, www.training.com.au, accessed December 2011. For research papers on GTOs see: www.ncver.edu.au/publications/bytheme.html. Kuczera, M. (2013b), *A Skills Beyond School Commentary on Scotland.* OECD Reviews of Vocational Education and Training www.oecd.org/edu/skills-beyond-school/ASkillsBeyondSchoolCommentaryOnScotland.pdf; Norwegian Directorate for Education and Training (2008), *Responses to the National Questionnaire – OECD Learning for Jobs*, unpublished.

A favourable economy should support the introduction of work-based learning

Economic pressures and economic downturns can limit the willingness of employers to offer work-based learning. In a review of literature Brunello (2009) notes the limited evidence, but suggests that apprentice numbers tend to drop even faster during recessions than do the numbers in employment.

The Israeli economy has coped well with the global economic crisis. In fact, many employers encountered during the visits were concerned with future skills shortages, in particular in mid and high-level technician jobs. As argued above in such a context it is much easier to involve employers in provision of training to students.

Notes

1. Trade union involvement in VET differs across countries typically reflecting their involvement in other domains of public policy.

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Chapter 5

Building pathways of access and opportunity for vocational students

Although many graduates of practical engineering programmes enter university programmes, they often do not receive adequate recognition for their qualifications. Many OECD countries have found that the key element in making vocational pathways attractive to young people is the possibility of career development and further education. With this in mind, a key element in the strategic expansion of the vocational education and training (VET) system recommended in Chapter 2 will be the development of effective pathways, both into vocational programmes, and from vocational into academic programmes, and this chapter advances recommendations to this end.

Challenge: Limited opportunities for upskilling

Two main challenges limit the attractiveness of vocational pathways in Israel, and tackling them will be important if such pathways are to be developed and expanded. The first problem is that vocational tracks at upper secondary level are sometimes dead ends, with limited opportunities to enter postsecondary VET or academic pathways. The second challenge is that graduates of practical engineering programmes face real obstacles in transitioning into higher education.

Limited further education opportunities for upper secondary VET graduates

Many of the students who pursue vocational tracks at upper secondary level do not pass the matriculation, which leaves them without access to further learning opportunities. About half of Israeli secondary school students attend vocational schools or technological streams in comprehensive schools (34% in Ministry of Education classes and 2% in Ministry of Economy training classes in 2008, CBS, 2013a). The Ministry of Economy framework focuses on students who have been unable to integrate successfully into comprehensive schools (Ashkenazy and Ballas, 2010).

Since 1994 it is possible for these students to take matriculation exams in subjects that will allow them to enter technician and practical engineering studies. These tracks in theory give a double qualification: a matriculation examination (*Bagrut*) and a VET certificate.

Table 5.1 shows that students in vocational tracks (under the definition used by CBS, this includes both technological and vocational tracks) are slightly less likely to meet university requirements than students in academic tracks[1] (CBS, 2013a). Anecdotal evidence shows that matriculation entitlements, and especially matriculation allowing entry to university, may be significantly lower for students in industrial schools and schools for apprentices.

Table 5.1 Matriculation achievements

In % of students enrolled in 12th grade – 2009

	Examinees	Entitled to a matriculation certificate	Met university entrance requirements
Total students	**83.6**	**56.7**	**46.9**
Students in Hebrew education	**81.6**	**58.5**	**49.7**
Ultra-Orthodox	28.2	10.3	5.5
General education (non-Orthodox)	92.4	68.4	59.3
General	78.1	59.1	51.1
Vocational	88.6	57.4	46.7
Students in Arab education	**91.2**	**49.9**	**36.0**
Moslems	90.6	47.8	33.8
Christians	95.6	63.8	56.0
Druze	92.6	54.9	36.4
General	91.4	49.2	34.1
Vocational	91.2	50.8	38.0

Source: Central Bureau of Statistics (CBS) (2013a), "Students in grade 12 matriculation examinees and entitled to a certificate", Table 8.26, in *CBS - Statistical Abstract for Israel 2013,* Central Bureau of Statistics, Israel, www.cbs.gov.il/reader/shnaton/templ_shnaton.html?num_tab=st08_26&CYear=2013

Several studies (Katz et al., 2008;[2] Zussman et al., 2005; Dagan-Buzaglo, 2007) show that matriculation achievements among students in the vocational tracks are lower than those of similar students (with respect to ability and background characteristics) in general tracks (for more about the implied equity concerns, see Chapter 2).

In Israel vocational tracks, like academic tracks, aim to prepare students for the matriculation examinations, and as a result the majority of students in principle are eligible for matriculation. However, few receive a matriculation examination that makes them eligible for further studies. As a result students from vocational tracks are a lot less likely to continue to postsecondary education (either practical engineering programmes – see Table 5.2 below) or academic higher education.

Students with no matriculation often face a dead-end

Access to postsecondary programmes (practical engineering programmes and to universities)

The entrance requirements for the practical engineering and technician programmes[3] are 12 years of schooling and having passed matriculation exams in maths, Hebrew and English at the minimum level. These programmes do not require a full matriculation certificate like universities, but in some colleges, students have to pass an additional admission exam.[4] In 2008 only 7% of practical engineering graduates wholly lacked the matriculation exam (see Table 5.1) (MOITAL, 2012).

Table 5.2 Characteristics of Ministry of Economy practical engineering graduates

2008

N=1950	% of participants
Women	31.3
Age	
Less than 30	74.5
30-39	19
40+	6.5
Education- highest certificate	
Full Matriculation	74.5
Partial Matriculation	19
No Matriculation	6.5
Population	
Immigrants	16
Non-Jews	16.5

Source: Ministry of Industry Trade and Labour (MOITAL) (2012), *Vocational Education and Training (VET): Background Report for Israel, OECD Project: Skills Beyond School*, Ministry of Industry, Trade and Labour ,The Manpower Training and Development Bureau, Israel, prepared by King, J. and Y. Eyal from Myers-JDC Brookdale Institute.

Access to higher education (universities and colleges)

Entrance to higher education depends not only on the matriculation test (*Bagrut*), but also on a separate psychometric aptitude test. There is some evidence of cultural bias in these tests and significant differences between Jewish and Arab students (OECD, 2011).

Lack of the matriculation examination may be the main barrier preventing VET graduates from entering university (Tamar Schafferman, 2007). Fewer than 8% of students without matriculation continued into higher education (CBS, 2013b) within eight years of finishing upper secondary education.

Of course, many of those with vocational qualifications do not want or need postsecondary qualifications. But many students from vocational upper secondary tracks enter the Open University – the only postsecondary institution that does not have entry requirements[5] (in the same proportion of those from academic tracks (CBS, 2013b),[6] which may suggest unmet demand from vocational graduates for higher opportunities. Similarly, a study on students attending postsecondary non-academic education (mainly teacher training programmes, and practical engineering and technician programmes) found that most students want to upgrade their education to a full academic degree later on (Yogev et al., 2005).

Weak transition from postsecondary to tertiary programmes

Universities have been legally permitted since 2006 to grant credit for prior vocational qualifications (practical engineering programmes and other two-year non-academic programmes): graduates may be awarded 30 credits for their practical engineering diplomas, equivalent to one semester in the bachelor programme (the full programme requires 160 credits). These credits are divided among various subjects in a way that does not exempt the student from entire courses.

This form of credit transfer is a possibility and not a right. The Council for Higher Education does not collect information from institutions about the extent to which it is realised in practice. There are also no data on how many students with a practical engineering diploma start a bachelor programme. This makes it impossible to see whether this represents a real option for many students, or just an abstract possibility in principle. The OECD review team were told that most universities are reluctant to grant these credit exemptions, and the exemptions cannot apply (by law according to the Council for Higher Education) to the core courses, despite the fact that these very courses would typically be the ones that would be duplicated. Students are therefore required to wastefully repeat courses.

The effect can be multiple inefficiencies: for the students because they have to repeat course material, for funding bodies that pay for such repetition and for institutions that often have to laboriously negotiate articulation agreements on a programme by programme basis. These challenges have been an issue in a range of OECD countries reviewed in the

course of the *Skills beyond School* exercise including Austria, Canada, Germany, Israel and the United States.

There may be inadequate incentives for higher level institutions to offer course exemptions. Given that many practical engineering graduates do in fact enter university[7] - 10% in engineering programmes, and 15% in other fields (MOITAL, 2010), the weak articulation between practical engineering programmes and university programmes is a serious challenge.

Practical engineering programmes' curricula are determined by the Ministry of Economy or the Ministry of Education (depending on the Ministry responsible for the programme). Universities can determine their own curricula, and are not always keen to put together programmes in which the courses and the curricula mesh with those of the practical engineering colleges. An additional difficulty is that there are significant differences between practical engineering programmes under the Ministry of Education and the Ministry of Economy, increasing the complexity of arranging credit transfer.

Recommendation: A systematic approach to transition

Take steps i) to improve the access of upper secondary VET graduates to further learning opportunities, including postsecondary VET; and ii) enhance access to universities and credit recognition for graduates of practical engineering programmes.

Supporting arguments

Three arguments support this recommendation. First, the current weak arrangements are undermining the efforts to raise the esteem of VET. Second, Israel needs to improve the access of VET graduates to further learning opportunities. Third, Israel needs to address the articulation issues between practical engineering programmes and universities.

Weak transition arrangements undermine the efforts to raise the status of VET

Many OECD countries have found that the key element in making vocational pathways attractive to young people is the possibility of career development and further education. With this in mind, a key element in the strategic expansion of the VET system, as recommended in Chapter 2, will be the development of effective pathways, both into vocational programmes, and from vocational into academic programmes. Such developments are

designed to be both appealing to students, and in line with increasing labour market needs for higher level skills.

During the review visit, it was repeatedly mentioned to the OECD team that the image of VET is negative and that many parents avoid sending their children to such programmes. This is especially true for the VET programmes under supervision of the Ministry of Economy at the upper secondary level. Efforts to raise the status on VET, include first, the "Technician and Matriculation" Programme,[8] led by the Ministry of Education in collaboration with the social partners (the Manufacturers' Association and the IDF). It offers the possibility of a one-year postsecondary technician programme while students study towards matriculation, granting a dual qualification. It is available in more than 100 schools, and enrols about 10 000 students. Second, the "Integrating Students in the Industry" Programme, a joint project of the Ministry of Education and the National Insurance Institute, which started in 2010 with 1 000 students per year, provides to disadvantaged students the possibility to complete both the matriculation and a professional qualification simultaneously, through significant placements in industry[9] (Ministry of Education, 2014b). Weak transition arrangements between vocational and more academic programmes risk undermining these efforts.

Improve the access of upper secondary VET graduates to further learning opportunities

Those who graduate from upper secondary vocational programmes need further learning opportunities, including the possibility of academic higher education via alternative routes to the "traditional" academic qualifications. In Israel preparatory programmes allow access to certain practical engineering programmes, but there are not common (see Box 5.1). What could be envisaged is to grant entry to specific study-fields in practical engineering and other postsecondary programmes (including university) based on students' vocational qualifications and/or work experience.

This would parallel the approach of many countries that are creating new alternative routes in higher education tailored to vocational students, through bridging courses and induction programmes. (See Figure 2.3 in Orr, Gwosc and Netz, 2011 for a European overview based on students' answers to a questionnaire). In Germany, for example, access to university for students without the normal higher education access qualifications was substantially opened up in 2009.[10] Austria, similarly, introduced the *Lehre mit Matura* in 2008 (Musset et al., 2013). Switzerland has been relatively successful at opening *Fachhochschulen* to graduates from the dual system, through the creation of the *Berufsmaturität*,[11] an optional general education

qualification to be completed in parallel to the dual system and that provides access to tertiary education. The proportion of dual system students obtaining the *Berufsmaturität* has increased steadily, and is now substantial, around 12% of all VET graduates and VET graduates represent half of the students enrolled in *Fachhochschulen* (Hoeckel, Field and Grubb, 2009).

Box 5.1 Preparatory programmes for practical engineering programmes in Israel

Applicants to practical engineering training colleges can pursue technological preparatory courses after 12 or 11 years of schooling (and without matriculation). The study tracks available are marketing and management, software engineering and electronic engineering.

The preparatory courses take eight months, at the end of which the students must take national as well as internal exams in Hebrew, English and maths. Passing the tests is considered as equivalent to meeting the admission criteria. Some universities offer similar preparatory courses, on a small scale.

Source: Ministry of Industry Trade and Labour (MOITAL) (2012), *Vocational Education and Training (VET): Background Report for Israel, OECD Project: Skills Beyond School*, Ministry of Industry, Trade and Labour, The Manpower Training and Development Bureau, Israel, prepared by King, J. and Y. Eyal from Myers-JDC Brookdale Institute.

Develop systematic arrangements to improve articulation between practical engineering programmes and universities

Some *ad hoc* initiatives already exist: for example, an agreement of the ORT network with Bar Ilan University allows each year 400 graduates of Ort Practical Engineers Colleges to continue their studies for one year to acquire an academic degree in economics and logistics (MOITAL, 2012). But this type of initiative is the exception rather than the rule.

On the face of it, if there are common modules in practical engineering and university programmes, there should be an exemption from that course for the practical engineering programme graduate. Graduates should be awarded more credits for their practical engineering diplomas (currently, they are awarded a maximum of one semester while practical engineering studies last two years), and the exemptions should also apply to core subjects (which is currently not the case).

To that end it is proposed that the advisory body on VET recommended in Chapter 3 should establish a commission on transitions, charged with improving the arrangements of articulation between programmes and semester exemptions. In the first instance, efforts could focus on practical

engineering programmes, and the transition to engineering bachelor degrees in universities, as there are obvious overlaps. Similar arrangements could then be implemented in other fields.

Articulation challenges are common across countries. Potential solutions include, first, measures to improve transparency in course content so that overlaps can be rapidly identified and addressed through course exemptions and, second, co-ordination mechanisms to try to simplify and regulate articulation arrangements and encouraging the articulation of curricula. Several examples are given in Box 5.2. To ensure that graduates of postsecondary VET education and training have the option to progress to higher education, their programmes need to ensure sufficient academic preparation, including in basic skills, and to underpin that with effective quality assurance.

Box 5.2 International experience of credit transfer and articulation

In Austria, graduates of vocational colleges can, in principle, start a bachelor's degree in a relevant study programme in the second or third semester, but the level of recognition depends on individual agreements between institutions and is sometimes absent. In response, many vocational colleges have developed partnerships with academic postsecondary institutions outside Austria, allowing their graduates to earn a professional bachelor's degree within around one year, a much swifter route than any available in Austria (Musset et al., 2013).

In Germany, postsecondary career and technical education (CTE) institutions (*Fachschule*) follow standards set up by provincial authorities (Land). This ensures comparability of programmes at the provincial level and allows students to transfer across postsecondary CTE institutions. But transition from postsecondary CTE to academic institutions remains a substantial challenge (Fazekas and Field, 2013).

In France, it is possible for *institut universitaire de technologie* (IUT) students after the first two years of study to be admitted by the *grandes écoles*, whose masters-level graduates may in turn, do their doctorate at universities (Dunkel and Le Mouillour, 2009).

In Norway, where credit recognition between institutions has been mandatory since 1981, between 10% and 20% of students change institutions during the course of their studies, mostly from universities to university colleges during the first three years, while the flows reverse afterwards (OECD, 2008).

In the United Kingdom, legislation allows two-year foundation degree students to progress to an honours degree (which otherwise would be a three-year full-time programme) through one additional year full-time, or two years part-time. Access or bridging courses are organised to prepare the transition from short-cycle to degree programmes but they are neither compulsory nor always available or needed. Professional experience is taken into account and facilitates the transition. In 2007-08, 59% of students who studied full-time for their foundation degree went on to study for an honours degree in 2008-09. Fewer part-time qualifiers progressed to an honours degree (42%). Most students who continued their studies did so at the same institution at which they were registered for their foundation degree.

Box 5.2 International experience of credit transfer and articulation (*continued*)

In Flanders, student transitions from associate to bachelor's degrees – in particular professional bachelor's degrees – seem relatively smooth, especially compared to other countries where students from vocational programmes may face many barriers to enter university. Programmes in associate degrees are built to fit in professional bachelors' programmes, allowing exemptions for modules common to both programmes. Transitions from postsecondary vocational programmes to employment are also smooth: in 2009, less than 7% of professional bachelor graduates were unemployed one year after graduation, half the level of those from academic bachelors programmes (Ministry of Education and Training, 2013).

Florida's unique articulation arrangement makes postsecondary career and technical education (CTE) programmes comparable across institutions and creates pathways across degrees and levels. Programme comparability is achieved through identification of course content within the State Course Numbering System. Courses that have the same content and are taught by teachers with comparable credentials receive the same number and are considered equivalent. Institutions therefore award the same amount of credit for equivalent courses regardless of the provider. This means that institutions cannot discriminate between internal and external students. All public institutions are required to comply with state-defined programme lengths and programme standards reinforcing comparability of programmes.

Source: EURASHE (European Association of Institutions in Higher Education) (2011), *Short Cycle Higher Education in Europe Level 5: the Missing Link,* http://files.eurashe.eu/wp-content/uploads/2011/11/SCHE-in-Europe-long-version-with-cover140311.pdf?918048; Dunkel, T. and I. Le Mouillour (2009), "Through the looking-glass: diversification and differentiation in vocational education and training and higher education", in CEDEFOP (2009), *Modernising Vocational Education and Training. Fourth Report on Vocational Training Research in Europe: Background Report, Volume 2*, CEDEFOP, Luxembourg, www.cedefop.europa.eu/etv/Upload/Information_resources/Bookshop/544/3050_II_en.pdf; OECD (2008), *Tertiary Education for the Knowledge Society: Volume 1 and Volume 2*, OECD Publishing, Paris. doi: http://dx.doi.org/10.1787/9789264046535-en ; Musset, P., et al. (2013), *A Skills beyond School Review of Austria*, OECD Reviews of Vocational Education and Training, OECD Publishing, Paris, doi: http://dx.doi.org/10.1787/9789264200418-en; Junor, S., A. Usher and V. Beach (2008), *Student Mobility and Credit Transfer: A National and Global Survey*, Educational Policy Institute, Canada; Fazekas, M. and S. Field (2013), *A Skills beyond School Review of Germany*, OECD Reviews of Vocational Education and Training, OECD Publishing, Paris. doi: http://dx.doi.org/10.1787/9789264202146-en.

Notes

1. Interestingly, students in vocational tracks are more likely to meet the entrance requirements of Universities in the Arab system - 34.1% for general track students compared to 38% for vocational track students (CBS, 2013a).
2. About 26 000 students; a propensity score matching estimation study, students in the technology track.
3. Applicants at the age of 35+ (30+ for technicians) are only required to have 12 years of schooling. In certain vocations (e.g. architecture), the applicant has to pass specific exams. If an applicant lacks only one matriculation exam, he is allowed to start his studies, but must complete the missing exam during the first year.
4. In some colleges, admission depends upon the score an applicant gets in a screening test administered by an external screening institute.
5. 3% of students with no matriculation access higher education entering colleges – some colleges accept in special circumstances students without matriculation, under other criteria such as the psychometric exam, professional experience, scores in a preliminary course and a personal interview.
6. The availability of part-time options (easier in the Open University) plays a significant factor in explaining the difference in continuation to higher education of vocational track graduates and general track graduates.
7. A follow-up study of practical engineering graduates found that within ten years after graduation, 56% continued to study – some 10% studied engineering at university, 15% studied for a bachelor's degree in a different field, 4% did graduate studies and 27% went on to other vocational studies (MOITAL, 2010).
8. Developed by ORT Israel and the Ministry of Education, the programme is operated in co-operation with the Manufacturers Association, the IDF, and the ORT, AMAL and AMIT networks, as well as in municipally run schools (Ministry of Education, 2014a).
9. It includes one or two days a week in industry.

10. New regulation permits those who pass an advanced vocational examination (e.g. *Meister*) a general entrance to academic higher education and holders of vocational qualifications without such qualification a subject-specific higher education entrance qualification.

11. The *Berufsmaturität* can be obtained either by attending courses during the apprenticeship (one day per week), in three-four semesters while working, or by attending a one-year full-time preparatory course after graduating from the VET programme.

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Chapter 6

Developing a dual-skilled teaching workforce

The quality of the teaching and training profession is as critical in vocational programmes as it is in general education. For vocational teachers there are often challenges in meeting the demanding dual requirement of pedagogical skills, and practical professional expertise. While most countries require teachers to have pedagogical preparation, and usually practical experience in their specialism, keeping that practical knowledge of the workplace up-to-date is often more difficult.

This chapter recommends arrangements to encourage a systematic approach in Israel to these dual requirements. First, part-time working arrangements, with practitioners continuing to work in their field while also working as trainee teachers, have obvious advantages. Second, directly recruiting practitioners from industry in mid-career is useful. Both strategies require a flexible framework of pedagogical preparation suitable to persons in this position (rather than one merely adapted to younger entrants to the profession).

Challenge: Career structure does not meet the dual requirement

In Israel, three challenges may be identified. First the formal requirements to become a teacher in practical engineering and technician programmes may not ensure an adequate balance of pedagogical training and industrial knowledge. Second, teacher in-service development opportunities may not be adequate. Third, rigid requirements to enter the profession and the limited use of part-time teachers create obstacles to the recruitment of those with significant industry experience, in a context of teacher shortages.

Balance of pedagogical preparation and professional competence is not adequate

In technician and practical engineering programmes under the supervision of both the Ministry of Economy and the Ministry of Education, an academic qualification is required for all teachers, although the requirement differs between the two Ministries. Both vocational and academic teachers in colleges under the supervision of the Ministry of Education must at least hold a bachelor's degree and complete a one-year teacher training programme[1] (Ministry of Education, 2013).

But in the practical engineering and technician courses under the Bureau (Ministry of Economy), there are in general no requirements for pedagogical training and experience in the vocational subjects,[2] even though there are such requirements for the theoretical subjects (MOITAL, 2012).

In both frameworks, practical industry experience is specified as required. But in practice many institutions under the supervision of the Ministry of Economy prefer to recruit teachers with work experience in industry (MOITAL, 2012). It does not seem to be the case for institutions under the Ministry of Education (partly because the requirements to teach there are a bachelor's degree, which does not favour the recruitment of those with significant industry experience). The implication is that vocational teachers under the Ministry of Economy may lack pedagogical training, while those under the Ministry of Education may lack industry knowledge and professional competences, as the entry requirements and initial training are more academic.

Lack of regular upskilling

In-service training is not mandatory for vocational teachers in programmes under the Ministry of Economy,[3] and depends on individual arrangements and institutions. But in colleges that depend on the Ministry of

Education, in-service training is organised by the Ministry and is mandatory (MOITAL, 2012). In addition, there are no specific professional development courses for vocational teachers of practical engineering and technician programmes (as mentioned in the 2006 general reform of teacher training guidelines). In-service training is not formally integrated and recognised as part of their job, and this can be a challenge in ensuring that teachers are up-to-date professionally.

Obstacles preventing people from industry from moving into teaching

Although some institutions employ professionals from industry as teachers on part-time contracts (mainly colleges under the Ministry of Economy (MOITAL, 2012)); this is uncommon (there are no data available on the share of part-timers.). The qualification requirements for part-time vocational teachers are the same as for full-time teachers, which is clearly a barrier, as part-time teachers can play an important role in linking teaching with up-to-date industry experience and it is not realistic to expect that a part-time teacher will want to pursue an extensive preparation (OECD, 2010).

This limits the opportunity for future recruitment. In Israel, many teachers, including teachers who migrated from Russia in the 1990s, are approaching retirement age and will need to be replaced (MOITAL, 2012). Institutions report difficulties recruiting teachers, particularly in fields where there is a high demand for skilled workers in the job market and the salaries offered by industry are higher than those offered in the education system (MOITAL, 2012; Nathanson, Levy and Simanovsky, 2010). The shortage will worsen in the next few years, and according to research by the Israeli Parliament Research Centre (Hasiyesi, 2013), by 2018 the education system as a whole will be short of 8 000 teachers, approximately 5% of the teaching workforce.

This review argues for a sustained expansion and strengthening of the vocational system. This will certainly require much more energetic and effective measures to encourage the recruitment of good teachers with industry experience.

Recommendation: Develop a consistent framework for the preparation of vocational teachers

Recommendation: Pursue reforms in vocational teacher policy in the practical engineering and technician programmes to meet the "dual requirement" of industry knowledge and experience alongside teaching skills by:

- ***Encouraging part-time working arrangements, allowing people with valuable work experience to enter teaching.***
- ***Designing initial teacher education programmes so as to ensure a good mix of pedagogical skills, vocational competence and industry knowledge.***
- ***Converging the entry requirements and training programmes for all teachers of practical engineering programmes to a common standard, under the Ministry of Education and the Ministry of Economy.***

Supporting arguments

There are two supporting arguments. First, those teaching VET students need to meet the dual requirement, and the recruitment of part-time teachers can be particularly helpful. Second, different qualification requirements for the different VET sectors are difficult to justify in principle and inhibit staff mobility and career development.

Flexibility in staffing arrangements helps to meet the "dual requirement"

The recruitment of part-time teachers can be particularly helpful to meet the dual requirement because these teachers, when they also continue to work part-time in industry, remain in close touch with the changing needs of the modern workplace. This pattern of working may also appeal to those who wish to develop a career as teachers but retain a job in industry (OECD, 2010).

In Israel entry requirements into the profession, in particular the academic ones, should be reviewed to ensure that they do not create barriers to part-time teaching. This is more specifically the case in the Ministry of Education framework, as in the Ministry of Economy, the requirements will depend on the subject taught. Currently, those with a degree in practical engineering or technician can only become a teacher in exceptional cases, after requiring special permission from the Commissioner of Technological Education (Ministry of Education, 2013).

As the shortage of teachers is acute in some professions and will worsen in the future with the wave of retirements, more flexibility in staffing arrangements would help alleviate teacher shortages. Allowing skilled workers to acquire their pedagogical competences in a flexible way can help them to practice as vocational teachers, and attract these professionals into teaching. It is an efficient way to deal with teacher shortage.[4] In Norway,

VET institutions and local employers co-operate to ensure an adequate supply of vocational trainers (OECD, 2010). Some countries use an alternative certification system to attract highly qualified candidates to the profession on a part-time basis (see Box 6.1).

Box 6.1 Alternative pedagogical preparation

South Carolina DIRECT programme

In programmes such as welding, cosmetology and culinary arts, individuals with relevant work experience can enter the teaching profession through the state's career and technical education (CTE) work-based certification programme. Candidates must show that they have the required competences by obtaining an appropriate industry certification or passing a state-approved competence examination in the chosen area. The prospective CTE trainers coming from industry and business often have little experience with teaching. To provide them with pedagogical skills and help them to make a successful transition from industry to school, an obligatory training programme (DIRECT) was designed especially to meet their needs. The DIRECT programme provides both classroom and hands-on instruction in methods of teaching, classroom and laboratory management, curriculum and assessment. Courses are provided in a block over a few days during the summer and on a couple of other Saturdays during the school year.

England's "Teach Too" programme

In 2012 the Commission on Adult Vocational Teaching and Learning identified the value of occupational experts from industry becoming involved in vocational teaching and learning. As part of developing this "two-way street", it called for the development of a new scheme to encourage working people to teach their occupation a few hours a week – a "Teach Too" programme. Implementation is under way.

Source: Kuczera, M. and S. Field (2013), *A Skills beyond School Review of the United States*, OECD Reviews of Vocational Education and Training, OECD Publishing, Paris, doi: http://dx.doi.org/10.1787/9789264202153-en; Musset, P. and S. Field (2013), *A Skills beyond School Review of England*, OECD Reviews of Vocational Education and Training, OECD Publishing, Paris, doi: http://dx.doi.org/10.1787/9789264203594-en

In Israel, the Ministry of Education has opened a few fast-track teacher training options for people who hold degrees in engineering and for students with honors degrees but these programmes are intended mainly for pre-primary and secondary school teachers, but there are no specific options for vocational subjects. An initiative at ORT Braude College offers teacher training programmes for engineers, with an annual enrolment of 60-70

students (MOITAL, 2012). This approach is promising but remains very small in scale. The OECD would recommend building on these initiatives,[5] and develop fast-track options to teachers in practical engineering programmes and to vocational subjects, across the country. Such programmes could be developed as a priority in the fields most affected by teacher shortages: car mechanics, car electronics, electricity, air-conditioning and refrigeration, electronics, maths, English, physics, computer and robotics (Lotan, 2009).

In Mexico, for example, where the pedagogical preparation of some vocational teachers was insufficient the OECD recommended that teachers receive pedagogical training before or shortly after entering the profession (Kis, Hoeckel and Santiago, 2009). In Korea where vocational teachers have strong academic and pedagogical preparation but often lack practical work experience in their field, the OECD review recommended recruiting VET teachers that have relevant prior work experience (Kuczera, Kis and Wurzburg, 2009). In both cases institutions needed to develop strategies to update the skills and their teachers, including their knowledge of technologies and working practices.

Common qualification requirements in a unified system

The competences required to teach practical engineering programmes are the same, whether the programme is provided by institutions managed under the Ministry of Education or the Ministry of Economy. This means that the current differentiation in terms of entry requirements and initial training cannot readily be justified. Convergence of teaching requirements has many advantages: it facilitates a more efficient use of resources, allows easier redeployment of staff across the two sectors and broadens the range of career options for staff. It should also help to underpin the notion of clearly understood common identity for the programmes involved that would be appealing to employers and convincing for other postsecondary learning institutions. The convergence of requirements may be part of a broader strategy to create an integrated VET framework. In Ireland at the time of the OECD review (Kis, 2010) vocational teachers in VET under the Department of Enterprise, Trade and Employment and in VET provided under the Department of Education and Skills had different requirements and qualifications, and the OECD recommended convergence of the two sets of requirements.

Notes

1. A one-year teacher training programme is required only from persons who hold an academic degree in subjects other than education.
2. A set of regulations by the Ministry of Economy specifies different requirements for different (vocational) subjects, including in some cases pedagogical training and industry experience, with important differences between subjects. In general, while pedagogical training is not required for those entering the profession as teachers, it is necessary for those wishing to become permanent.
3. The Bureau organises teacher training days about once a year, but participation is not compulsory.
4. The respondents remarked that in order to solve the problem they offered higher salaries to teachers, or that sometimes they compromise on quality (in terms of relevant professional experience it seems) (MOITAL, 2012).
5. Nathanson, Levy and Simanovsky (2010) in a report on the future of VET in Israel similarly recommended retraining technicians and practical engineers with significant experience, by giving them the pedagogical training to teach in a classroom setting.

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Further reading

OECD (2010), *Learning for Jobs*, OECD Reviews of Vocational Education and Training, OECD Publishing.

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