



Alternative Pathways to High School Graduation: An International Comparison

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By

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Abstract

Over recent decades, many western nations have stepped up their efforts to increase high school graduation rates while maintaining high standards. How systems have approached this, and how successful they are, varies. One of the key differences is in the range of high school programs and the pathways to graduation. This paper documents and examines some of the alternative pathways offered in different countries. What are the main alternative pathways? How do they work? For whom do they work? Are they of equal value? The benefits and costs of alternatives provided in different national systems are highlighted using case studies, including a comparison of the pathways in terms of content, graduation requirements, inclusiveness and outcomes.

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Introduction

Rates of school high school graduation and dropout vary across western nations. However, one thing that does not vary much is the finding that not completing high school and failing to gain equivalent education and training qualifications is associated with poorer labor market outcomes. Consistently, research in different countries shows that dropouts are more likely to become unemployed, stay unemployed for longer, have lower earnings, and accumulate less wealth over their lifetimes (for example, see Rumberger & Lamb, 2003; OECD, 2001; Barro, 1997). They also more often experience poorer physical and mental health, higher rates of crime, and less often engage in active citizenship (Levin *et al.* 2007; Owens, 2004; Rumberger, 1987). In addition to the costs for individuals, there are also social costs associated with increased welfare needs and reduced taxation revenue (Levin *et al.* 2007; Owens, 2004).

Addressing the dropout problem presents a major test for education and training systems. For any system, the challenge in encouraging more young people to remain at school is finding ways to deal with *pupil diversity*. In all countries, young people who leave school before obtaining a high school qualification (in many countries referred to as an *upper secondary qualification*) tend to come from disadvantaged social and racial backgrounds, they tend more often to have become disengaged from school, are less motivated scholastically, and more often experience personal difficulties and behavioural issues that place them at risk (for example, see Lamb *et al.*, 2004; Rumberger, 1987; Audas and Willms, 2001; European Commission, 2005). They also tend to have histories of school failure and low academic achievement during the elementary and lower secondary years. In the past, many systems have not needed or attempted to provide for all young people in an inclusive way at upper secondary level. Commonly they awarded a certificate at the end of lower secondary education (often at age 16, typically the end of grade 10). Participation beyond this point was optional. In the United States, while the compulsory attendance age varied from state to state, students only received a certificate of completion (diploma) after four years of upper secondary (typically at age 18) (Lloyd, 2007). Encouraging more low achievers and other young people at risk of dropping out to remain at school and complete a qualification exerts great pressure on the flexibility of institutional arrangements and qualification structures.

Responses to these issues vary across nations, depending on the organization and structure of upper secondary education. One type of response is to diversify the range of opportunities available in high school in order to encourage young people to remain in school and graduate. This sort of approach, with a focus on accommodating young people within school, involves what might be termed “internal differentiation strategies”, that is, strategies internal to school systems which seek to reduce the dropout problem by changing or expanding the sorts of opportunities available in high school programs and the requirements for entry and successful completion. Two broad types are evident:

1. Some countries have attempted to expand opportunities by offering alternative qualifications in high school. This can be done in separate single-purpose schools as in China or Germany. However, even where students attend a single school type, different courses may be offered according to student ability or interest, such as in Australia or New Zealand. These courses may lead to different levels of qualification, and therefore grant access to different educational and employment opportunities. Some European and other Organization for Economic Cooperation and Development (OECD) countries have made serious efforts to encourage more students to remain in high school and to improve qualification rates by diversifying the sorts of programs and qualifications provided. For example, between the mid-1980s and mid-1990s, as a means of encouraging students to remain in school, Finland and Norway implemented a number of educational reforms focusing largely on expanding vocational education options. Both nations saw growth in high school graduation rates (OECD, 2001).
2. Other countries provide alternative options within the same qualification to address pupil diversity. Within school, the students may be directed towards different tracks leading to a similar qualification. Many countries offer high school diplomas based on satisfactory achievement in a prescribed number of core or common subjects, and a range of elective subjects. The requirements for qualification can vary substantially across systems. Sweden and the U.S. offer credit-based models, in which each course provides a set number of points that may be accumulated over the course of the program towards high school graduation and the attainment of a high school diploma. Other systems, such as many of the states in Australia, require students to successfully complete a set minimum number of subjects to qualify for a school certificate, even if the specific subjects can vary substantially across types and fields of study.

In terms of the different approaches to the provision of high school programs and qualifications, there can be substantial variation within as well as across countries. Federated systems, such as the United States and Australia for example, can have different approaches, qualifications and completion requirements across jurisdictions. As an example, the recent introduction of exit exams in California as a hurdle requirement to graduation aligns the state with practices in some states and sets it apart from others. Similarly, in Australia, the state of Victoria provides an alternative senior school certificate to the mainstream diploma, while other states and territories do not.

School-based diversification strategies are not the only focus of efforts to respond to the dropout problem. Some countries provide alternative pathways to work and adult life for young people who are no longer at school and who dropped out without gaining a qualification. This reflects more of a focus on “external diversification strategies” to provide alternative opportunities for young people, particularly dropouts. These can include extended opportunities for school graduation through recovery programs or study in alternative settings, provision of a breadth and depth of alternative qualifications and study opportunities through further education colleges,

the provision of work-based indentured training contracts such as apprenticeships, and alternative routes involving combinations of work, training and study.

It is possible for countries to employ both types of approaches — to encourage young people to remain in school and gain a qualification through the provision of more diversified high school programs as well as strengthening the range of post-school pathways available to those who leave without first gaining a qualification from school. Such approaches are evident in several systems and reflect the continuing tension between the effort to prevent school dropout and strategies to assist those who have already dropped out. One component of this tension is the potential for successful non-school alternative pathways to act to encourage larger numbers of young people to leave school before completing a qualification. This sort of counter-effect needs to be considered in assessing the value, impact and importance of alternative pathways.

The aim of this paper is to document and, where possible, evaluate the various options nations offer for students to graduate with a high school diploma or equivalent. It will examine both the diverse range of opportunities provided within schools and the alternative pathways provided for young people outside of schools. What are the main alternative pathways? How do they work? For whom do they work? Are they of equal value? Case studies of national systems will be used to highlight the benefits and costs of alternatives provided in different settings. Part of this will involve a comparison of the different pathways in terms of content, rigor and graduation requirements. It is important to examine the various options in terms of how similar or differentiated they are on standards of learning and achievement, and whether they lead, and how effectively they work to reduce dropout rates and deliver real benefits for those who participate. This means also considering the extent to which alternative pathways are inclusive (who gets included), and deliver quality learning and outcomes. It is of little use providing alternatives if they promote stratification which leads to inequality in outcomes just as successfully as if the alternatives were not provided.

School-based pathways

Growth in graduation rates

A major challenge facing all school systems is how to construct and deliver programs that cater to diverse populations of students. But it is not only about providing space, it is also important to ensure evenness of quality so that all programs deliver similar value or benefits from both a learning and outcomes perspective. Recent international comparisons of high school graduation rates are revealing both in terms of what they disclose about the success of some countries in building universal systems of secondary education capable of delivering programs to a whole cohort, and in what they conceal about differences in access and effectiveness in terms of quality of outcomes.

Table 1 presents high school (upper secondary) graduation rates per population at the typical age of graduation for a number of selected OECD countries in 2004. It shows that the chances of graduating from school with a high school qualification vary across countries. The graduation rates range from a low of 66 percent in Spain to a high of 100 percent in Norway. The rates show very high rates of graduation — over

85 percent of the relevant age population — in 8 of the 16 selected countries. It is 90 percent or more in 7 countries, nearly universal levels of graduation. This is quite an achievement given the pressure of student diversity evident in historical patterns which show that getting all children to graduate from high school has proven remarkably elusive, until recently.

Table 1: Percentages of High School Graduates to the Population at the Typical Age of Graduation, by Type of Program, 2004

	Total	General	Vocational
Denmark	90	58	56
Finland	90	52	75
France	81	33	70
Germany	99	36	62
Iceland	84	61	52
Ireland	92	66	34
Italy	81	29	67
Japan	91	68	24
Korea	96	66	30
Luxembourg	69	28	42
New Zealand	75	x	x
Norway	100	66	45
Spain	66	45	25
Sweden	78	37	41
Switzerland	89	29	70
United States	75	75	x
<i>OECD average</i>	81	47	44

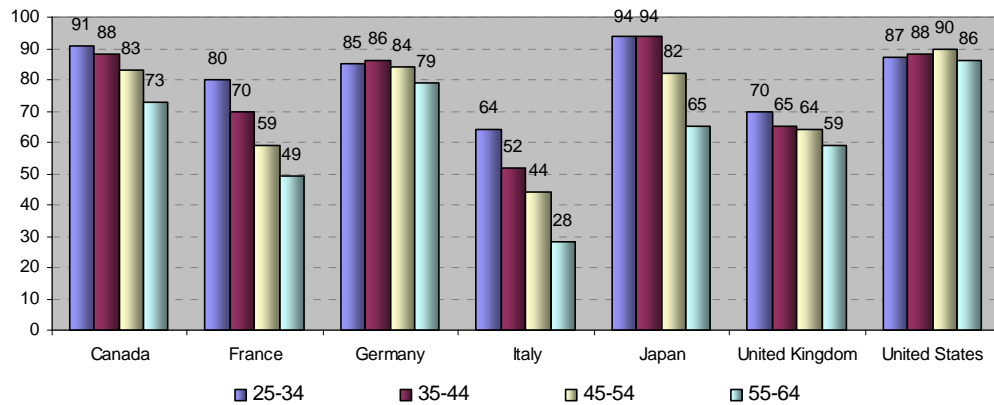
Source: OECD (2006). NOTE: X=not available.

There has been a marked increase in most countries in high school graduation rates. This is evident in looking at generational changes in levels of educational attainment. Figure 1 reports the percentages of national populations with high school qualifications broken out by age group: 25- to 34-year-olds, 35- to 44-year-olds, 45- to 54-year-olds, and 55- to 64-year-olds. It shows that, apart from the United States, high school graduation rates have increased for younger age groups, highlighting recent growth in the numbers completing high school. The growth in rates of graduation is quite marked in several countries, in some cases almost doubling. For example, in France about 42 percent of 55- to 64-year-olds attained a high school qualification compared with 76 percent of 25- to 34-year-olds. Similar growth among younger adults is evident for Canada, Italy, Japan and the United Kingdom. Generational change sees major increases in rates of high school graduation.

Growth is not as evident in the United States. The proportion of younger adults (25 to 34 years of age) who had graduated was about seven percentage points higher than for the oldest adults (55 to 64 years of age). This relatively small difference reflects the fact that the United States had already achieved, in large part, a mass system many decades ago. Its relatively high and stable levels of high school graduation across generations suggests a much longer history of inclusive secondary education, at least in terms of overall levels of participation. The evident success in achieving mass participation almost two generations before many European countries, according to Goldin (2001) and Benavot (2006), has been based in part on strong public funding of

education, the removal of a selective or elite model of institutional organization, and a comprehensive model of provision with a common general curriculum supplemented by a broad range of subject and course offerings. Recent concern has been expressed about the lack of further increases in graduation rates in the United States (see National Center on Education and the Economy, 2007, for example), but the history suggests stable longer term patterns of graduation compared to other nations.

Figure 1: Percentage of the population that has graduated from high school, by age group and country: 1999



Source: OECD (2006).

The recent growth in graduation rates in European as well as other OECD countries (see Lamb et al., 2004, for an outline of developments in Australia, and OECD, 2006, for recent figures on other countries), representing large reductions in the levels of dropout, reflects several influences including labor market factors as well as changes in the programs and qualifications offered in high school.

Changing patterns of employment and the demands of employers for a better educated labor force have affected the demand for high school graduates. In some countries, measured over the long term, there is a relationship between graduation rates and the state of labor markets. As Furlong (2006) has observed in the United Kingdom, as recently as 25 years ago the majority of young people left school at the end of junior secondary (when students had reached the compulsory leaving age) to enter full-time jobs. But opportunities for unqualified teenagers declined due both to deterioration in the youth labor market and to long-term structural changes in industry and the demand for labor which reduced full-time job opportunities for young people and led to rises in youth unemployment. Studies in several countries show long-term falls in full-time teenage job opportunities (for example, Lamb, 2002, in Australia; Furlong, 2006, in the United Kingdom). Structural changes to economies over the last 30 years have gradually, but dramatically, changed the number and types of jobs available to young people. Accompanying the fall in full-time work has been a substantial growth in part-time jobs. These have been focused largely in areas (such as retail and related services) which tend to employ young people still in the education system, in jobs that are more often short-term and not those sought by young people wanting full-time work and careers.

As labor markets have changed and full-time jobs for young people become harder to find, students have tended to remain longer at school and gain qualifications to

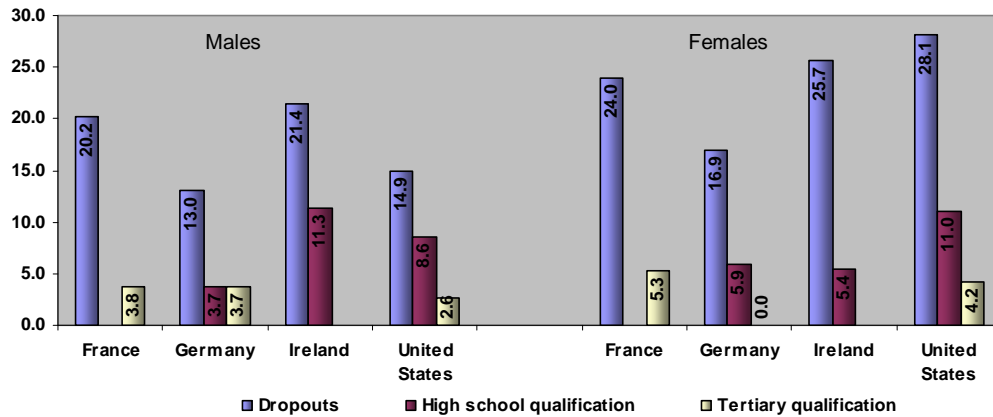
facilitate labor market entry and career growth. In this sense, school has acted as a refuge from deteriorating teenage labor markets, leading to higher levels of high school graduation. One consequence of this is a decline in the value of high school qualifications (*qualification deflation*). But the corollary to this is that high school qualifications have become, increasingly, a minimum requirement for labor market entry. Increased competitiveness for job opportunities makes dropouts less attractive to employers, placing pressure on students to stay on and complete high school qualifications or enter alternative forms of education and training. High school graduation has become the main educational point of entry into the full-time labor force across OECD countries, and young people without high school or equivalent qualifications increasingly struggle to find full-time work.

This point becomes apparent when looking at patterns of employment linked to educational attainment. Figure 2 presents the unemployment rates for males and females five years after leaving school for four OECD countries. It shows that rates of unemployment are markedly higher among those without high school qualifications. The pattern is consistent, occurring across all nations, even though the level of qualification gain varies. It is stronger for females than for males, suggesting that in terms of avoiding unemployment the returns to high school qualifications are greater for females than males. In the United States, for example, there was a 6.3 percentage point gap between male dropouts (less than upper secondary) and male graduates (those with an upper secondary qualification). The gap for females was 17.1 percentage points, implying that the returns to high school qualifications over dropping out are stronger for females than for males. This was also true across the other nations, highlighting the greater pressure and incentives for females to remain in school and graduate.

Similar patterns of returns to high school qualifications are recorded against spells of unemployment, types of occupations, and earnings.

Other work shows that the returns to high school graduation relate not only to individuals; there are social and broad economic gains. The social returns to education include the monetary and non-monetary costs and benefits associated with improvements in health, family structure, fertility and child welfare, crime, and the environment. Numerous studies suggest that higher levels of educational attainment are likely to lead to improvements in health, and a reduction in poverty and associated problems (Behrman and Stacey, 1997; Levin et al. 2007). For example, while there may be debate about the exact amounts, increases in educational attainment are likely to lead to improvements in the quality of health for individuals leading to reductions in public expenditure on healthcare. There is also likely to be cost-savings in other areas, such as from reduced rates of crime. For communities there are also the broad economic gains associated with increased lifetime income and tax payments that accrue from higher levels of high school graduation (see Levin et al., 2007; Hanushek, 2005).

Figure 2 Unemployment rates five years after leaving initial education by educational attainment and gender (%)



Source: OECD (1998)

Despite the economic and labor market pressures promoting growth in high school graduation, the capacity for national systems of education to respond has varied depending on the range of alternative high school programs and qualifications. Growth has occurred in most systems, but not evenly. Some countries are doing better than others in promoting strong rates of high school graduation, largely due to the range of programs and qualifications they have put in place.

But even in countries which have provided places for the vast majority of students and virtually eliminated dropout, it is not the case that all study is of equal value. Rather, the programs and qualifications can vary in quality. High school programs are diverse and can include academic, general, vocational, and technical courses, with variations in entry requirements and in pathways to post-school opportunities. These variations are important to consider to get a sense of which curriculum structures operate to benefit the largest number and range of students. Which systems provide options that deliver not only quantity (making places available), but also quality (good outcomes for all) in terms of learning and school to work transition?

Differences in high school provision

The provision of high school education tends to vary across two broad dimensions. The first is the level of *program diversification* or the variety of programs that are offered. This can include differently-focused strands or streams such as academic programs, professional and technical courses, vocational education, and in some countries, subject-based strands such as specialist art, music, humanities, and science programs (as in Italy, for example). The different programs orient students toward different post-school outcomes. For example, in many countries students who enter and complete academic study (sometimes called ‘general education’ in some countries) qualify more often for university entry, whereas those who undertake and complete vocational education are more likely to enter other forms of tertiary education or go directly into the labor market after secondary education. The

programs can be delivered as separate certificates or as separate strands or options within the architecture of a single certificate. For example, in some systems there is a menu of separate certificates and qualifications, each tied to a different strand of learning. In other systems there is a single certificate or qualification (such as a high school diploma), but with structured options producing academic, general and vocational tracks or streams that also work as pathways to different post-school options.

The second broad dimension is the extent of *institutional segregation* (or integration), which refers to the extent to which young people are separated into different schools or streams and tracks on the basis of the programs or qualifications in which they enroll.¹ In some systems this can occur early and extends well back into junior high school or even elementary school. In Germany, for example, it is common at the end of the elementary school years for many students to be separated into different schools based on interests and aptitudes. Schools tend to be divided into those offering a more academic curriculum (*gymnasium*, university-preparatory), those offering specialist technical training (*realschule*) and those with a more vocational focus (*hauptschule*). Alternatively, in other systems, such as in Sweden, Norway and the United States, students tend to remain in the same type of school through both the lower and upper secondary years, able to pursue a variety of programs or courses within the one institution.

Institutional segregation and *program diversification* are mutually linked. Both are driven by curriculum requirements, and the demands of the academic curriculum are central to this. The variations in school organization and programs divide nations in high school provision. However, there is a common element across all national structures and that is the status of the academic curriculum. All systems give pre-eminence to academic knowledge. Some call it *general education*, while others refer to it more directly as *academic*. Regardless of differences in nomenclature, it works to stratify the operation of all programs and systems and has historically proven intractable to the provision of an inclusive universal program or organization. In its various forms embodied in school subjects, and as a separate strand in the senior years, it tends to be organised and taught in ways that exclude and discriminate. Other programs and alternatives have been developed in part because of the failure of any system to construct a curriculum or program based on academic knowledge, including methods of pedagogy and assessment, which operates for all students. This failure may be because the cultural demands associated with the academic curriculum work to distance parts of the student body (for further discussion see Bourdieu, 1984; Teese, 2000). Students from poorer backgrounds tend to be most affected.

The effect is to devalue other forms of knowledge and exclude or distance large numbers of students. All other forms of knowledge tend to be treated as second class, or at least not as equal in status. The problem in part is because in terms of function, the academic high school curriculum has been designed to prepare students for

¹ This is different from the process of residential segregation which produces marked divisions in some systems, separating students on the basis of where they live and their racial and social backgrounds. Regional or residential segregation can create sharp divisions between schools in terms of intake, separating students almost as effectively as selective schooling. It also has a marked impact on student progress and outcomes, at least according to a range of school effectiveness studies (see, for example, Willms, 2006).

university, rather than to be organised and to work as a common stage of learning within and of itself. Preparation for university tends to dominate its form and function, working as a “conserving force” against attempts at universalisation. It has prevented the development of truly democratic, inclusive and universal programs of teaching and learning built around a common curriculum.

One thing is certain: while many things divide nations, the content and role of the academic curriculum does not; it is truly a global feature of school systems. The stratifying effect of providing academic programs geared to university preparation operates in all countries, with the extent varying depending on the structure and number of alternative programs and the organization of schools.

Table 2 presents information for a select number of OECD countries on features of school organization. It reports on school settings including the ages at which young people enter high school and the level of institutional differentiation or segregation. High levels of segregation operate where young people enter different schools according to the streams or courses that they enter, or because they are divided across schools on academic ability lines. Low levels of segregation occur in systems that more often operate comprehensive schools, catering for a range of student skills and interests within the one type of school. There are also countries that have mixed arrangements in which there is some separation across schools on the basis of academic skills or program choices, though also there are integrated or comprehensive schools that cater to a wide variety of students. Admission requirements to high school vary depending on the types of schools and their level of differentiation.

Table 2: Comparisons of pathways to graduation: *features of school organization*

	Compulsory Years		Features of upper secondary schooling (organizational setting)	
	Age range	Age of entry	Level of segregation	Admission to type of upper secondary school
Australia	5-16	16	Mixed: largely comprehensive, some selective-entry schools	Partly selective: some schools use ability testing for entry
Austria	5-15	14	High: academic, technical, vocational, specialist schools	Selective: Entry is dependent on type of school attended and academic achievement.
Denmark	4-16	16	Mixed: some integration, though largely separate: general (gymnasium), technical, vocational.	Partly selective: Entry is dependent on completion of formal exams at the end of compulsory education and teacher recommendation.
Finland	6-16	16	Mixed: general (gymnasium) and vocational schools	Non-selective
France	3-16	15	Mixed: general (general and technological <i>lycées</i>) and vocational schools (<i>lycées professionnels</i>)	Partly selective: Entry is dependent on completion of formal exams at the end of compulsory education
Germany	6-18	15	High: academic (gymnasium), technical, vocational, specialist schools	Selective: Entry is dependent on type of school attended and academic achievement.
Iceland	3-16	16	Mixed: some integration, though largely separate: general (gymnasium), comprehensives, vocational.	Partly selective: Varied admission based on results at end of compulsory education.
Italy	3-15	14	Mixed: general (<i>liceo</i>) and vocational schools (<i>istituti</i>)	Non-selective
Japan	4-15	15	High: academic senior high school and vocational and technical schools	Selective: highly competitive entrance exams
Netherlands	5-18	12	High: academic (VWO), general (HAVO), vocational (VMBO) schools	Selective: Entry is dependent on type of school attended and academic achievement, selection at end of elementary school.
Norway	6-16	16	Low: largely comprehensive	Non-selective
Scotland	4-16	16	Low: largely comprehensive	Non-selective
Spain	3-16	16	Mixed: largely comprehensive (Institutes for Secondary Education), though some specialist vocational schools	Non-selective
Sweden	6-16	16	Low: largely comprehensive	Non-selective
England	4-16	16	Low: largely comprehensive	Non-selective
United States	6-16	16	Low: largely comprehensive	Non-selective

Sources: OECD, 2006

Qualifications and Curriculum Authority, International Review of Curriculum and Assessment Frameworks Archive

Eurydice: Eurybase — the information database on education systems in Europe

Table 3 presents features of high school programs and qualifications. It provides details on the various programs and qualifications that are offered in each country. This includes information on typical duration of courses, program specific entry requirements (what criteria are set to enter each type of program and qualification?), broad course content (in terms of core subjects and electives and associated arrangements), and the main form of assessment (exams, school-based assessment, other forms). In order to compare differences in qualifications standards, which can vary both within and across national systems, it is important to consider the formal completion criteria—what is required to graduate and obtain a qualification. These can affect both the post-school opportunities, such as entry to university, and the rates of graduation. Details on these are provided with graduation rates expressed in terms of the typical age cohort, revealing the proportions of young people in each country who are likely to graduate with each type of qualification.

Table 4 presents some broad outcome indicators. These are provided at a system level rather than at a qualification level, since qualification-specific outcomes are not available either widely or consistently in an appropriate or systematic form for fair comparison. The broad indicators that are presented give some insight into the overall function and performance of system arrangements. Measures include *achievement levels* (mathematics achievement measured through Programme for International Student Assessment (PISA)), *access indicators* (how inclusive are the qualifications and programs for the whole student population), and *transition outcomes* (what the upper secondary arrangements deliver in terms of labor market experience). The levels of PISA achievement relate to 15-year-olds and, therefore, achievement prior to upper secondary schooling in many systems. However, they provide a measure of the impact of school organization and differentiation. The measures selected for inclusion are those that relate to between-school differences in achievement (percentage of variation in student achievement that is linked to differences between schools rather than students, all else equal). The second PISA measure is the percentage of between-school differences accounted for by the SES backgrounds of students and schools. This gives us an indication of the extent to which school arrangements and diversification work to stratify or separate students along social lines. The *access indicators* provide measures of, and the percentage of, young people who have left school without obtaining a high school qualification. The second indicator is a direct measure of the capacity of high school programs to accommodate and retain students. The *transition indicators* assess returns to study. They report rates of unemployment for dropouts and for graduates. Also included is the university entry rate, expressed as a percentage difference from the OECD average.

Table 3: Comparisons of pathways to graduation: *features of qualifications*

	Features of high school qualifications (program setting)								Cohort Grad. rate
	Structure	Qualification	Duration (Yrs)	Entry requirements	Content	Form of assessment	Minimum completion requirements	Provides access to:	%
Australia	Varies by state	Senior school certificate (varies by state)	2	Open	Elective-based system, English compulsory in some states	External and school-based	Pass grades in at least 4 subjects	University, work, further education	68.0*
		VET certificates, school-based apprenticeships (single or dual)	1-2	Open	Module based, industry specific	School/module-based assessment.	Successfully completed course work	Work, further education	14.0*
		Certificate of Applied Learning (Victoria only)	1-2	Open	Elective-based system, VET focus	School-based assessment.	Successfully completed course work	Work, further education	4.8
Austria	Separate	Certificate of Secondary Education (Reifeprüfung certificate)	4	Dependent on type of school attended and academic achievement.	Core subjects (Mathematics, German, Foreign Language) and small number of electives	School-based written and oral exams with examination panel including at least one external panel member	Passing grades in compulsory subjects and electives (matriculation)	University and professional schools	12.8
		CSE and TVE Diploma (Reifeprüfung and TVE Diploma)	4	Dependent on type of school attended and academic achievement.	Core subjects (Mathematics, German, Foreign Language) and electives	School-based written, practical and oral exams with examination panel	Passing grades in compulsory subjects and electives (matriculation)	University and professional schools	8.6
		Professional matriculation certificate (Berufsreifeprüfung)	4	Training certificate completion	Core subjects (Mathematics, German, Foreign Language) and professionally-relevant subject	External examination	Passing grades in compulsory subjects and electives (matriculation)	University and professional schools	20.5
		Apprenticeship certificate (dual system)	3-4	Open	Core subjects (Mathematics, German, Foreign Language) and professionally-relevant subjects	Examination	Passing grades in compulsory subjects	Trades, occupations, higher education	30.2
		Vocational certificates	2-4	Open	Core subjects (Mathematics, German, Foreign Language) and professionally-relevant subjects	School-based written, practical and oral exams with examination panel	Passing grades in compulsory and practical subjects	Trades, occupations, Berufsreifeprüfung	17.9
Denmark	Separate	Gymnasium upper secondary certificate (STX)	3	Dependent on successful completion of formal exams at the end of compulsory education and teacher recommendation.	Two main programs (Languages, Mathematics). Core subjects common to both programs (Danish, history, biology, music, geography, visual arts, religious education, classical studies, physical education), core subjects unique to each program and specialist electives. Some options can be taken at different levels (Intermediate or high).	External written and oral exams in 10 subjects	Successfully completed examinations and program work with a minimum grade-point average	University	22.7
		Higher preparatory upper secondary certificate (HF)	2	Dependent on successful completion of formal exams at the end of compulsory education and teacher recommendation.	Common core subjects, three optional subjects and a major written assignment. Some options can be taken at different levels (Intermediate or high).	External written and/or oral exams in every subject studied	Successfully completed examinations and program work with a minimum grade-point average	University	4.0
		Higher commercial upper secondary certificate (HHX)	3	Dependent on successful completion of formal exams at the end of compulsory education and teacher recommendation.	Business and commercial studies focus. Core subjects, optional subjects and a major written assignment. Subjects are offered at different skill levels (A, B, C).	External written and oral exams in 10 subjects.	Successfully completed examinations and program work with a minimum grade-point average. At least 2 of the subjects must be at 'A' (highest skill) Level.	University	7.9
		Higher technical upper secondary certificate (HTX)	3	Entry is dependent on successful completion of formal exams at the end of compulsory education and teacher recommendation.	Technical studies focus. Core subjects, optional subjects and a major written assignment. Subjects are offered at different skill levels (A, B, C).	External written and oral exams in 10 subjects.	Successfully completed examinations and program work with a minimum grade-point average. At least 2 of the subjects must be at 'A' (highest skill) Level.	University	2.8
		Vocational education and training (EUD)	1-4	Open	Seven programs comprising basic and main courses.	School-based assessment with tests and an exam to measure proficiency	Successfully completed exam and program work with a final exam/proficiency mark	Trades and occupations	42.8

Table 3 (cont.)

Features of high school qualifications (program setting)									Cohort Grad. rate
	Structure	Qualification	Duration (Yrs)	Entry requirements	Content	Form of assessment	Minimum completion requirements	Provides access to:	%
England	Separate	General Certificate of Education Advanced-Level (A-Levels), Single subject qualifications	2	GCE AS levels	Range of elective subjects, commonly between 2 and 4 taken by a student.	External examination.	Pass grade in exam.	University	42.4
		GCE Advanced-Subsidiary (AS-Levels) Single subject qualifications	1	No official criteria, though GCSE results can be considered	Range of elective subjects, cover half of the content of full 'A' levels. Commonly 4 or more subjects selected.	External examination.	Pass grade in exam.	University and further education.	
		General Certificate of Education A-levels in Applied Subjects. Four qualifications available.	2	No official criteria, though GCSE results can be considered	Courses are available in 10 vocational subject areas and are organised on the lines of the GCE AS and A format.	External tests and internal assessment.	Pass grade in requisite subjects.	Work and further education.	8.2
Finland	Separate	Matriculation examination certificate	3	Entry is dependent on successful completion of the compulsory education syllabus.	Mother tongue (Finnish or Swedish) and three other core subjects from the second national language, other language, mathematics, general studies (science and humanities subjects) and at least one elective. Subjects in some core areas are offered at different levels of difficulty.	National Written Examinations	Passing grades in all compulsory subjects with at least one subject taken at the advanced level (matriculation)	University	27.6
		Certificate in general upper secondary education	3	Dependent on successful completion of the compulsory education syllabus.	Core subjects and electives. Subjects in some core areas are offered at different levels of difficulty.	School-based	Passing grades in program syllabus	Polytechnics (professional higher education)	3.8
		Certification in Vocational Upper Secondary Education and Training	3	Dependent on successful completion of the compulsory education syllabus.	Mixture of core general studies (same as national core curriculum), electives and workplace learning. 52 qualifications, 113 study programs across 8 broad industry sectors.	School work, theory and competence-based assessments	Successful completion of studies	Work and polytechnics	36.5
		Apprenticeship qualification certificate	1-4	Dependent on successful completion of the compulsory education syllabus.	Mixture of core general studies (same as national core curriculum), electives and workplace learning.	School work, theory and competence-based assessments	Successful completion of studies	Work and polytechnics	11.5
France	Separate	General Baccalaureate	3	Completion of lower secondary education	Three types of programs (Literary, Economic and social sciences, Scientific). Minimum of eight or nine compulsory subjects plus a maximum of two optional subjects in each program.	National written and/or oral examinations in core and elective subjects	Passing grades in examinations	University	34.6
		Technological Baccalaureate	3	Completion of lower secondary education	Four types of programs (sciences and tertiary technologies, sciences and industrial technologies, sciences and laboratory technologies, medico-social sciences). Three specific programs for the hotel trade, applied arts, music and dance. Core and elective subjects.	National written and/or oral examinations in core and elective subjects	Passing grades in examinations	University	18.9
		Professional (Vocational) Baccalaureate	2	Completion of lower secondary education	Compulsory general subjects and professional studies relevant to different occupations and industries.	Written, practical and oral examinations in core and elective subjects, as well as work and training assessments during the course.	Successfully completed examination and program work	Work, further education, university	12.5
		Certificat d'Aptitude professionnelle (CAP) Or Brevet d'Etudes professionnelles (BEP)	2	Completion of lower secondary education	Compulsory general subjects and professional studies relevant to different occupations and industries.	Tests or exercises based on compulsory subjects and professional studies	Successfully completed examination and program work	Work, further education	17.0

Table 3 (cont.)

Features of high school qualifications (program setting)									Cohort Grad. rate
	Structure	Qualification	Duration (Yrs)	Entry requirements	Content	Form of assessment	Minimum completion requirements	Provides access to:	%
Germany	Separate	Zeugnis der Allgemeinen Hochschulreife	3	Entry is dependent on type of school attended and academic achievement.	Small number of majors selected from 3 areas (languages, literature and the arts; social sciences; mathematics, natural sciences and technology) with each area needing to be included	Abitur examination (written and oral exams)	Passing grades in at least 4 subjects	University	27.3
		Vocational leaving and apprenticeship certificates (dual system)	2-4	Open	Workplace training and school-based formal curricula established by the lander. Training covers 350 professions.	Final examination before an examination board relevant to the training industry. Practical and written component.	Successful completion of the exam	Trades and occupations	48.5
		Technical and professional certificates (such as the Fachgebundene Hochschulreife and the Fachhochschulreife)	2-3	Dependent on type of school attended and academic achievement.	Specialise in subject areas such as engineering, economics, farming, the welfare system, and design. Students are also usually required to study core subjects (such as German, social sciences, mathematics, natural sciences, one foreign language and sport) from the three general subject areas.	Final written and oral exams	Successful completion of the exam	Trades, occupations, higher education	12.2
Iceland	Separate	Matriculation examination certificate (studentsprof)	4	Varied admission based on results at end of compulsory education.	Three main academic programs: foreign languages, natural sciences and social sciences. Students required to take core subjects (regardless of program), specialised subjects according to particular program of study, and electives.	Examination and continuous assessment	Successfully completed examinations. Can also be awarded from the accumulation of internally set unit-credits.	University	39.4
		Journeyman's examination (sveinsprof)	4	Open	Study comprises general academic subjects, theoretical vocational subjects and practical vocational subjects. Students must take a certain number of credits in general academic subjects.	Journeyman's examination and continuous assessment of practical and theory work.	Passing grades in exam and course work.	Trades, and occupations.	40.6
Italy	Separate	Upper secondary leaving certificate (diploma di Stato)(Classica/Linguistica/Scientifica/Tecnica/Professionale/Magistrale/Artistica)	5	Lower secondary diploma (primo ciclo di istruzione)	Core and elective subjects, with electives varying by specialisation.	Three written examinations and one oral examination.	Successful completion of exams with a minimum grade-point average	University	63.5
		Professional skills qualification (Diploma di Qualifica Professionale)	3-5	Lower secondary diploma (primo ciclo di istruzione)	Core and elective subjects, with electives varying by vocational specialisation. Specialisation involves basic training in either agriculture, industry and crafts, or the service sector.	Examination	Successful completion of exam and course work	Work, further vocational education	5.8
Japan	Separate	Upper secondary school leaving certificate (academic)	3	Entrance exam	Credit-based system of core subjects (Japanese language; geography and history; civics; mathematics; science; health and physical education; art; home economics) and small number of possible electives.	School-based assessment	Achieving threshold of credits (80) by successfully completing the required number of core and elective subjects	University entrance exam	66.1
		Upper secondary school leaving certificate (vocational/technical)	3	Entrance exam	Credit-based system of core subjects and specialised vocational or technical electives.	School-based assessment	Achieving threshold of credits (80) by successfully completing the required number of core and elective subjects	University and work	24.7
		High school graduation qualification test		Individuals who have not graduated upper secondary school	Exams cover core subjects in the general upper secondary curriculum.	Examination	Passing grades on exams	University entrance exam	

Table 3 (cont.)

Features of high school qualifications (program setting)									Cohort Grad. rate
	Structure	Qualification	Duration (Yrs)	Entry requirements	Content	Form of assessment	Minimum completion requirements	Provides access to:	%
Netherlands	Separate	Upper secondary preparatory Diploma (VWO)	5	Achievement and school recommendation	Four programs (science and technology; science and health; economics and society; culture and society) with some common core subjects.	National examination and school exam/assessment.	Passing final grades with minimum overall grade	University	22.9
		Upper Secondary General Education Diploma (HAVO)	6	Achievement and school recommendation	Four programs (science and technology; science and health; economics and society; culture and society) with some common core subjects.	National examination and school exam/assessment.	Passing final grades with minimum overall grade	Professional higher education, VWO	21.2
		Upper Secondary Vocational Diploma (VMBO)	4	Achievement and school recommendation	Four programs associated with four industry or business sectors, each with its own combination of exam subjects.	National and school-based examinations	Passing final grades with minimum overall grade	Work, further education	41.0
Norway	Separate	Upper Secondary Leaving Certificate (general)	3	Initially open, promotion can depend on achievement	Three general programs (General and business studies; Music, dance and drama; Sports and physical education).	Written and/or oral examinations and school-based assessment	Passes in all subjects and exams required for each program with minimum level of achievement in core subjects.	University	44.0
		Vocational qualification/trade or journeyman's certificate	3	Open	Twelve vocational streams	Centrally set theoretical and practical examinations	Passes in all subjects and exams required for each program with minimum level of achievement in core subjects.	Work, further education	29.9
Scotland	Integrated	National Qualification Certificates.	1-3	Initially open, level of study depends on achievement	National Qualifications are available at five levels: Access, Intermediate 1, Intermediate 2, Higher, and Advanced Higher. Courses cover both general and vocational subjects. There are no compulsory subjects. National courses often involve three subject-related units.	Internal and external assessment	National Course Qualifications are awarded to those who pass all of the internally assessed components and achieve a passing grade on the external exam for the course.	University, work, further education	
Spain	Separate	Bachiller certificate (Bachillerato)	2	Lower secondary certificate (Graduado en Educación Secundaria)	Four programs (Arts; natural science and health; humanities and social studies; technology) with some common or core subjects.	School-based assessment	Pass grade in all subjects.	University entrance exam, advanced level specific vocational training	45.0
		Intermediate Specific Vocational Training Certificate (Técnico)	1-2	Lower secondary certificate (Graduado en Educación Secundaria)	Modules of theoretical and practical training based on 22 vocational fields, with some core subjects and field-specific options. Workplace module is compulsory.	School-based and workplace assessment	Pass grade in all subjects and modules.	Work, advanced level specific vocational training	21.0
Sweden	Integrated	Upper secondary leaving certificate (Slutbetyg från gymnasieskolan)	3	Lower secondary certificate (grundskola)	Two academic and 16 vocational strands. There are core subjects (Swedish, English, mathematics, civics, religion, science studies, physical education and health, and artistic activities) common to all strands plus specialist subjects.	School-based with national tests in 3 core subjects (Swedish, English, Mathematics)	Requisite number of credits with a pass grade in at least 90 percent for a completed course of studies, including a pass in a compulsory upper secondary certificate project	University, work, further education	88.0
United States	Integrated	High School Diploma (Regular/Standard, Vocational, Honor/Regents, College Preparatory)	3	Open	Subjects can be clustered into vocational, general and academic tracks based on system of core subjects (often English, mathematics, social studies, science, health and physical education) and electives.	School assessment on the basis of grades and work over the year.	Satisfactory completion of a specified number of subjects (credits), designated on each diploma, varying by State. Minimum exit exam achievement scores in some states.	Higher education and work	75.0
		General Educational Development Certificate (GED)		Individuals who have not graduated from high school	Tests cover Writing, Social Studies; Science; Reading; and Mathematics.	Examination	Pass grade in all tests.	Higher education and work	11.0

Sources: Qualifications and Curriculum Authority, International Review of Curriculum and Assessment Frameworks Archive

*= Not mutually exclusive

Eurydice: Eurybase — the information database on education systems in Europe

National Ministries of Education — Austria, Denmark, France, Finland, Germany, Iceland, Italy, Japan, Netherlands, Norway, Spain, Sweden

U.S. Department of Education, National Center for Educational Statistics. Dept for Children, Schools and Families, England.

National Statistics Bureaus: Australia, Austria, Denmark, France, Finland, Germany, Iceland, Italy, Japan, Netherlands, Norway, Spain, Sweden

Table 4: Comparisons of pathways to graduation: *selected outcome indicators*

	Selected outcome indicators							
	Maths achievement (PISA)		Access			Transition		
	% school-level variance in maths achievement	% of variance explained by between-school differences in SES intake	% in programs in compulsory years leading to Upper Secondary CTE	% of 25-34 year-old dropouts	% of 15-19 year-olds not in education or employment	% of 20-24 year-olds not in education and unemployed by qualification level		% deviation from OECD average in university entry
					Dropouts	Graduates		
Australia	22.0	15.4	0.0	23.0		11.1	3.1	
Austria	55.5	35.2	42.9	13.0	10.2	12.0	4.2	-16
Denmark	13.1	9.3	0.0	14.0	3.0	6.0	4.7	+2
England	21.1 ^a	15.3 ^a		30.0 ^a	9.4 ^a	10.7 ^a	3.7 ^a	-1 ^a
Finland	3.9	0.9	0.0	11.0	9.8	10.5	6.0	+20
France			9.5	20.0	14.0	23.7	9.8	
Germany	56.4	43.8		15.0	4.7	12.6	8.8	-16
Iceland	3.6	0.3	0.0	32.0	4.3			+26
Italy	56.8	30.5		36.0	10.5	16.2	8.0	+2
Japan	62.1	42.0	25.4	6.0				-10
Netherlands	54.5	40.7	61.3	20.0	4.6	7.4	2.7	-20
Norway	6.5	2.9	0.0	4.0	2.7	10.9	4.0	+16
Scotland	na	na	na	na	na	na	na	na
Spain	17.2	9.8	0.0	39.0	7.3	7.3	2.8	-6
Sweden	10.9	5.8	0.0	9.0	4.2	11.9	8.2	+26
United States	27.1	18.7	0.0	13.0	7.0	11.3	5.1	+10

a=Figures are for United Kingdom na=not available

Sources: OECD (2006)
OECD (2004)

Academic pathways to graduation

Every system provides programs and courses that work to prepare or select students for university, and this influences school and program organization. Even so, there is some variation in the requirements for graduation and access to higher education.

In some systems, neither the number of subjects nor the disciplines to be studied for accreditation are prescribed. For example, students in England and Scotland may achieve accreditation in a single subject of their own choosing. In these systems, there are no compulsory subjects at high school or upper secondary level, only electives with the breadth of subject offerings dependent on school size and demand. Students choose from a range of subjects available as *General Certificate of Education (GCE) 'A' Levels* and *GCE Advanced Subsidiary* qualifications. Assessment is academic and competitive, involving external examinations controlled and administered by GCE examining boards. High standards are required to pass the subject and gain accreditation, but this can be in one or several subjects of the student's own choosing. It could be described as a system of standards, in terms of accreditation, but standards without subject or knowledge prescription. For example, students could achieve high levels of learning in particular fields, such as history while having poorly developed skills in other areas, such as mathematics. University preparation is sponsored in the areas of intensive study, and supported through a rigorous system of external examinations. However, accreditation is not based on a minimum number of subjects designed as a 'course' and covering a range of learning areas.

In other systems, the academic curriculum at upper secondary level is much more prescribed. In Austria, for example, students undertaking the matriculation certificate (*Reifeprüfung*) must study three compulsory subjects — mathematics, German, and a foreign language — and additional subjects from a range of specialist and interdisciplinary electives. The electives provide for some specialisation in certain areas depending on the school. The focus can be on classical languages, mathematics and the sciences, economics and business, instrumental music, or art. Similarly, in Finland, students are required to study four compulsory subjects (mathematics, general studies, mother tongue, foreign language) and at least one elective. In both systems, assessment is based on academically competitive examinations with graduation based on minimum grade levels.

Another common model is one involving a range of core and elective subjects grouped into specialist programs, with the course requirements varying by the length or duration of high school study. Denmark, for example, offers two main types of academic programs, one focused on languages and the other on mathematics. There are core subjects common to both programs (Danish, history, biology, music, geography, visual arts, religious education, classical studies, physical education) as well as core subjects unique to each program and specialist electives within each program. Graduation requires successful completion of externally administered written and oral exams with a minimum grade-point average. France, Italy, the Netherlands, Norway, Spain, Sweden, and Iceland all operate versions of this model of provision involving separate specialist academic programs with core subjects common across all strands and either prescribed subjects or electives within each

specialist course. Graduation is largely based on examinations, sometimes competitive national exams as in France and the Netherlands, with minimum passing grade scores for individual subjects and a minimum overall score. Some systems, such as Sweden and Spain, use school-based assessment, though even in these systems there is sensitivity and pressure to the issue of 'academic standards'. In Sweden this has seen the introduction of national tests in key core subjects (mathematics, English, Swedish) which have to be used by teachers in the awarding of grades in these subjects.

Graduation (sometimes referred to as matriculation, or '*matura*') in most countries requires successful completion of a minimum number of subjects. In Sweden this means gaining a requisite number of subject credits through successfully completing a course of study. In many systems the requirement is for achieving minimum grade-levels in at least five subjects including a set number of compulsory subjects covering different key learning areas (such as mathematics and native language). An overall score, the equivalent of a grade-point average derived from a minimum number of subjects, is sometimes used to set as a threshold or standard for the successful completion of the award.

The function of academic programs in all systems, and the requirements around graduation and certification, are influenced by the process and needs of university selection. But there are some important differences in how this works. In some systems, successful completion of academic credentials at the end of schooling automatically qualifies students for entry to university without any further admission requirements. In Germany, for example, candidates who are successful in the *Abitur* (the achievement examination taken on completion of upper secondary education) are awarded a general higher education entrance qualification (*Allgemeine Hochschulreife*). The *Abitur* grants access to any course of study and all subject areas at universities and higher education institutions. Similarly, in Austria, the *Reifeprüfung* or *Matura* entitles its holders to enroll in university studies of their choice without any further limitation of access, even though access to some specialist courses may require additional subject study and assessment. In the Netherlands there may be different programs of academic study, but the VWO (matriculation) certificate automatically qualifies pupils to enter university and higher professional education without further selection.

The onus of selection for university is removed from universities themselves in such countries because the whole organizational structure of schooling, programs and qualifications works to regulate the quality of students, delivering to universities a pool of academically selected and prepared students, homogenous in skills, training and orientation. Numbers of students are also regulated because academic selection tends to occur early, more rigorously and more overtly than in other systems. The universities can be bold enough to distance themselves from involvement in the business of selection for entry because school organization from an early stage is geared to the needs of academic recruitment and the promotion through matriculation of a minority of highly selected students. In all three systems the separation of students along academic lines occurs at the end of elementary school or shortly thereafter. The majority of students in each system are channelled away from academic programs into vocational, professional and technical education paths at an early age. Table 4 shows that the three systems have the highest proportions of

students in elementary and the junior high school years enrolled in programs leading to vocational education in high school (42.9 percent in Austria, 61.3 percent in the Netherlands and 43.8 percent in Germany). A minority — between 20 to 40 percent — are grouped into schools delivering intensive academic training leading to matriculation and university entry. The differentiation mainly occurs on the basis of students' ability and preference and already orients students towards post-school study (university, higher education or other forms) or to the labor market on completion of school. Consequently, the rates of entry to university tend to be well below OECD averages in the three systems (see Table 4). These countries also tend to have high levels of variation in academic achievement across schools. Approximately 56 percent of the variance in math achievement among 15-year-olds in Germany is due to between-school differences (compared to 27.1 percent in the United States, 10.9 percent in Sweden and 3.9 percent in Finland, see Table 4).² In Austria, the rate was 55.5 percent and in the Netherlands 54.5 percent. Social differences in intake account for much of the between-school differences in all three countries (43.8 percent in Germany, 40.7 percent in the Netherlands and 35.2 percent in Austria). This is an indication that the school systems are highly segregated along social as well as academic lines.

University selection also influences the graduation requirements in other countries. However, where systems are more comprehensive and high school less differentiated, both in terms of school organization and program structure, universities tend to undertake their own selection process or be heavily involved in the establishment of selection criteria. They are less likely to rely on school qualifications as the sole requirement for admission. In Sweden, for example, a system that has some similar features in school organization to that of the United States, all high school programs give access to higher education. Admission decisions on the selection of students are made by the individual universities. This occurs within a national framework of credit points awarded for high school study based on teacher assessment, other specific tests such as the university standard aptitude test, and previous education and work experience. In Spain, successful completion of the *bachillerato* (baccalaureate) grants access to the university selection process. In order to enter university, students must currently, in addition to obtaining the *bachillerato*, pass a national admissions examination.

The academic courses and high school graduation criteria work in such systems to provide access to the opportunity to compete for university selection, rather than to a university place itself (as would happen in Austria or Germany). The most extreme version of this is in Japan where, despite highly competitive academic exams at different stages of schooling, at which success is necessary for access to the next stage, students who graduate with a high school “leaving certificate” (credit-based system of core and elective subjects with minimum threshold for completion) have to

² These figures were derived through an analysis of mathematics achievement using the PISA mathematics scale (see OECD, 2004, p. 161-163 for an explanation of method). Variance was measured based on percentages of the average variance between OECD countries in student performance. For example, the total variance in student performance in the United States was 9016 compared to the average OECD variance level of 8593 giving a percentage of 104.9. For each country, variance is divided between that attributable to achievement levels of students in different schools (between-school differences) and that attributable to the range of student results within schools (within-school differences).

sit for a competitive national university entrance exam in order to be considered for admission to university.

In such systems the universities do not rely on the school qualification alone as the entry status marker. This is in part because the number of university places falls far short of the numbers of students graduating from the academic school programs. In some countries, such as Australia, the response is to use high school subject grades translated into a university entrance score. In other systems, such as in Sweden and Spain, it is to impose further selection requirements such as entry exams. It may be no coincidence that such practices occur in countries that have been successful in promoting higher proportions of students into academic programs in high school or by delaying selection of branches of study to much later in schooling. A sizeable group of countries possess a largely comprehensive model in which students continue with a core curriculum until the end of the compulsory years (often at age 16). This is the model that exists in England and Scotland, many of the Nordic countries, as well as Spain, France and Italy. In these countries, students only choose a particular branch or type of schooling at the end of the compulsory phase (age 16 or Grade 10), often following exams or assessments that lead to an accredited school certificate or qualification. Few countries have the system of secondary schooling that characterizes the United States and most states of Australia in which there is no secondary school certificate or formal assessment to mark the end of the compulsory years.

Countries which postpone the point at which students have to choose a particular branch or type of schooling (those with no or low percentages of students in programs in the junior years tracking to high school vocational courses, see Table 4) do tend to encourage more students into academic programs leading to higher education. This can operate within the structure of a single certificate arrangement, as in the United States and Sweden, where all students who graduate formally or technically qualify for higher education, or in a diversified high school program and accreditation structure as in Norway, Denmark, Spain, Japan and France where there are academic and alternative qualifications and only part of the student population enters a program oriented to university entry, even though it tends to be the majority of students.

Systems which defer the point of program choice tend to encourage more students into academic courses. But it would be wrong to conclude that institutional and program arrangements in such systems are not geared around the selective requirements of academic preparation for university entry. Even the most integrated and formally open high school systems tend to be organised around the principles of academic preparation. Norway, for example, offers a wide range of general and vocational high school programs which work to accommodate diversity in aptitudes and interests while maintaining a more homogeneous group of the most academically skilled in the university-preparatory courses. Graduation from the academic preparatory courses is based on examination success and minimum grade-levels in core subjects. In the United States, tracking serves the same purpose. Subject selection or more formal ability selection can work to group higher achieving students together in higher tracks, usually in math and science classes, and low achieving students in lower track classes. The system of college preparatory classes for advanced students and general education and vocational classes for others sifts and

sorts along academic lines, working to serve the needs of academic preparation as the primary function.

The standards debate around graduation, and the push in the United States to install hurdle requirements through exit examinations and high-stakes testing, is usually focused on the standards of those who are not college-bound and the minimum skill levels they should possess or display in order to earn a diploma. A problem is that if higher standards are set (and high quality learning and achievement for all is a worthy national goal for education) it is important to ensure that the conditions are in place to deliver high quality learning for all. Currently, the upper secondary structures in most countries effectively prepare selected proportions of students for academic pathways. The challenge is around how effectively they deal with the learning needs and achievement standards of the remaining groups of students.

Alternative pathways

Not all students are able or want to pursue academic pathways leading to university. Because traditional high school courses were designed for a minority of students, most countries have developed alternative courses and qualifications to enable an increasing number of young people, with a wider range of abilities, to participate in high school courses and graduate with a relevant qualification. The alternatives mainly involve technical and vocational education or what has become known in the United States as Career and Technical Education (CTE). In these developments, one challenge for systems has been to ensure that the programs are of high quality, that they foster commitment to learning and personal development, and that they have valued employment or further education and training outcomes. Another challenge has been to ensure that the programs provide standards of learning that enable continued study in further education once students leave school, rather than being terminal options. The structure, function and quality of programs have major implications for addressing the problems of dropout because it is often the sorts of students at risk of dropping out — those who are not achieving well, those who have tended to become disaffected with school and formal academic work — who are likely to be attracted to available alternatives. The strength and operation of alternative pathways in the upper secondary years is important to consider in looking at ways of addressing the problem of dropout.

How systems approach these challenges varies. Countries contrast greatly in the degree to which CTE and academic and general studies complement each other and in the ways in which they are sequenced. Countries differ, for example, in terms of whether CTE and general streams run in parallel or in integrated programs, in terms of the breadth and depth of occupational qualifications, in terms of the timing and nature of the choices that young people have to make between distinct pathways and post-school destinations, and in terms of assessment and graduation requirements.

One type of approach is to integrate or incorporate CTE options within the general structure and organization of a more traditional high school curriculum. This often involves offering a menu of CTE subject or unit options from which students choose, in combination with general and academic subjects, options that can be used as part of credit sequences which accumulate and are counted with other credits to meet

graduation requirements. This approach could be described as an ‘education or school-based’ model of CTE provision because it attempts to incorporate CTE education into the existing structure and logic of more traditional senior school studies. Even though CTE units or subjects can be organized around areas of employment, industry or occupation, the modules of study tend to be school-based and school-delivered, designed in line with assessment and syllabus requirements of traditional school subjects. This approach is more frequently provided in systems that have comprehensive school settings in the upper secondary years attended by university-bound students as well as those pursuing other destinations.

In the United States, students pursuing a CTE program can select vocational programs and sequences of courses from particular occupational program areas such as agriculture, business or health care. Under these arrangements, the sort of pathway CTE-track students would follow to graduation is to take a minimum number of credits in compulsory areas (such as English, mathematics, social studies, science, health and physical education), along with a number of credits in elective subjects from a CTE menu organized around the different occupational program areas. The CTE electives can represent as much as one-third of the required high school study. Alternatively, students may take no CTE subjects, since most high school students are free to take as much CTE coursework as they want. This means that there can be varying levels of intensity of study in CTE. Figures from the 1990s reveal that while the majority of students take at least one CTE course (defined very broadly to cover occupationally-specific labor market preparation subjects, to consumer education and technology), about 21 percent took a concentrated sequence of units that could be described as a CTE program or track (Laird et al., 2006). The rest enrolled in either a college-preparatory (38 percent) or general (41 percent in neither a college-preparatory nor vocational) preparation. Of the 21 percent taking largely a CTE program, about a quarter also completed a college-preparatory curriculum.

Based on outcomes data, CTE programs would appear to deliver some benefits as an alternative pathway for potential dropouts. Bishop and Mane (2004) reported that compared to other course-takers, students taking higher concentrations of CTE courses were more often lower achievers (based on Grade 8 grade-point average) and from lower socio-economic status (SES) backgrounds. Even so, in an analysis of short and long term returns to their high school study, Bishop and Mane found that compared to other school-leavers, those with more CTE preparation tended, all else equal, to spend more time employed both in the initial post-school years and 8 years later. Other studies report equivalent rates of employment, though lower levels of participation and completion in post-secondary education and lower earnings for those with stronger vocational preparation in school (Laird et al., 2006; Levesque et al., 2000). Bishop and Mane (2004) noted that stronger emphasis on vocational preparation courses in upper secondary education tended to increase school attendance of 15- to 19-year-olds.

A similar model of CTE operates in Australian states and territories. The majority of young people enter a general education pathway at the end of compulsory education (Grade 10 in most states). Usually completed over two years, students can undertake as many CTE subjects as part of their senior school certificate as they wish. To qualify for a certificate, students must generally complete a sequence of elective units or subjects with most final year students needing to successfully complete a minimum

of four subjects, including English, in order to graduate. One difference with the U.S. model, however, is that as well as obtaining a high school certificate, students enrolled in CTE courses can also obtain a separate certificate for their CTE study, effectively providing a dual qualification. School CTE programs can consist of stand alone, nationally-recognised industry-specific courses based on industry training packages, which are also accredited for the high school certificate, though integration varies across states. Some of the CTE programs contain structured workplace learning with expected competency-based learning outcomes included in assessment.

In 2001, at a national level, about 21 percent of Year 12 students enrolled in at least one CTE subject or course (Lamb & Vickers, 2006).³ The rate was 29 percent for students from the lowest quartile of SES, and 11 percent for those from the top quartile. The chances of unemployment in the first post-school year were lower among graduates who had undertaken some vocational preparation than among dropouts, and similar to non-CTE graduates, though this varied depending on the type of program studied. There is also some evidence that students who studied CTE courses in school were more likely to remain at school because their CTE study (including experiences in the workplace) helped them to form more positive views about learning and school. Students in Year 9 who reported plans to drop out more often graduated if they entered CTE courses rather than academic or general programs (Lamb and Vickers, 2006). This is consistent with some early U.S. studies suggesting that, all else equal, the more CTE classes students take, the less likely they are to drop out (Mertens, Seitz, and Cox, 1982, for example), and with findings based on studies of the effects of work-based learning programs in the United States, where similar evidence emerges concerning the positive effects on student engagement that result from participation in work-based learning (Hughes, Bailey, & Mechur, 2001; Steinberg, 1998).

A second broad approach to the provision of alternative pathways to graduation in high school is to provide stand-alone CTE qualifications where there is little or limited attempt at integration with the academic or general high school curriculum. Instead, the alternative pathways have much stronger connection to employment and enterprises. The content of programs (including identified occupation skills and competencies) and assessment are often designed by agencies involving employer and craft associations, usually accredited or administered by labor and commerce ministries rather than education departments, and often legally governed by vocational training or commerce acts rather than education statutes. In such systems, CTE programs and qualifications have close links with the labor market and weak links with higher education, even though further education is often possible in the same vocational area. It is therefore sharply differentiated from academic programs, whose dominant purpose is to prepare students for university. The programs and qualifications are mainly provided in separate schools. It is also a feature of such systems that separation or preferences tend to occur earlier in school, and students participate in schools and courses in the earlier years that already orient them towards CTE or vocational programs in the later high school years. There are several examples.

³ The rate is closer to 14 per cent using the approach applied in the United states by Laird et al. (2006) in defining a CTE program or course as a concentrated sequence of CTE units or subjects.

In Austria, young people choose between a general education and several vocational pathways at a relatively young age. Most opt for vocational/technical pathways, with about twenty percent of all students completing their ninth year of compulsory schooling at a one-year pre-vocational school (*polytechnische schule*) which qualifies them for transition to apprenticeship training within the dual system. There are a number of different types of schools offering technical and vocational education and training (TVE) in the high school years. In general, there are two pathways, the first involving apprenticeships in the framework of the dual training system, and the second involving study at a secondary technical or vocational school (*berufsbildende mittlere schule*) which provides intermediate vocational training, or at an advanced-level secondary vocational school (*berufsbildende höhere schule*). After reaching the end of the compulsory years, over 50 percent of students enter a school-based vocational route, or apprenticeship.

Similar structures are found in Germany, the Netherlands and Denmark. In Germany, the education of students in the high school years is predominantly characterized by vocational education, involving the majority of students. A clear link is made between continuing general education and vocational education through the dual system framework, which combines school and workplace education. In the Netherlands, secondary education, compulsory until the age of 16, is offered at several levels. Lower secondary vocational education (VMBO) programs combine general and vocational education, after which pupils can continue in upper secondary vocational education and training (MBO) lasting one to four years. Upper secondary vocational education (MBO) is offered in the areas of economics, technology, health, personal care, social welfare and agriculture. MBO programs vary in length from one to four years as well as in level (1 to 4). About half of upper secondary students take vocational programs.

There are variations to this broad approach, with many systems delaying the separation of students along CTE or vocational pathways until the post-compulsory years (after Grade 10). Examples are provided by Italy, Spain, Japan and France. In France, for example, students complete compulsory education at College before entering one of two broad paths, either the general and technological path involving the general or technological baccalaureate, or secondary vocational training (vocational *lycée*) which combines general education with specialised technical training. The key high school vocational qualifications are the “*Certificat d’Aptitude Professionnelle*” (CAP) and the “*Brevet d’Etudes Professionnelles*” (BEP) both taken in two years, both offering training in a wide range of occupations in industrial, commercial and service sectors. It is possible for pupils who pass the BEP to do a further 2 years study to get the “*Baccalauréat Professionnel*” (BP), giving access to university. About 40 percent of high school students enroll in vocational programs, and about 17 percent leave school having completed the CAP or BEP. In Japan, of the around 30 percent of high school students who take a vocationally-based program, approximately two-thirds enter vocational high schools (either special training colleges or miscellaneous schools) for a three-year course. The remaining third enter the college of technology for a five-year course. Vocational programs combine learning modes with theoretical and practical education at a vocational school or college, alternating with practical training in an approved company or organization. Courses are based on promoting applied technical skills linked to key occupations.

According to some, one of the potential benefits of this broad employment-based model of CTE provision, is that it is more likely to contribute to the development of young people's job-related human capital, because the skills it promotes are more closely aligned with employers' demands, labor market needs and current occupational practice (see Iannelli and Raffe, 2007; Shavit and Mueller, 1998). Furthermore, in contrast to systems where the CTE courses are school-based and at risk of being marginalised due to the higher value placed on knowledge taught in academic programs, in the more employment-based models CTE programs (and the students who take them) are less likely to be stigmatized or ignored by employers because employers have more direct knowledge of the programs and of the students they recruit. Extended workplace experience also means that young people have more contact with employers and easier access to recruitment networks, providing advantages in the search for employment. Alternatively, there is the potential for employment-based models to lead to weaker general education skills and fewer opportunities for participation in post-secondary education, particularly access to university.

A third broad type of approach to the provision of alternative pathways is one in which separate CTE programs are offered leveling high school, but which retain links with academic and general education and provide avenues or are connected to higher education. Examples are provided in several Nordic countries, in particular Sweden, Norway, and Finland. In Sweden and Norway high school education is provided in comprehensive schools as in the United States and Australia. In Sweden, after completing compulsory schooling, students proceed to a three-year upper-secondary school. Starting upper secondary education means choosing between a wide set of different educational tracks, or "programs". Currently there are 17 national programs and numerous regional special programs. Over 50 percent of students enter one of 14 national CTE programs when they enter the post-compulsory years, with remaining students taking up one of two general courses. All programs include a common set of core subjects (Swedish/Swedish as a second language, English, Mathematics, religion, civics, science studies, physical education and health and artistic activities) with the core subjects accounting for about one-third of the tuition. The remaining time, pupils study program-specific subjects and choices. The national programs are frameworks within which the pupils can choose various specialisations, based on a sequence of credit-based units with graduation requiring successful completion of a requisite number of core and other credits. The CTE programs are based on specific occupations and industries. All national programs qualify students for further study including higher education.

Completion of basic education in Finland leads to the choice in high school between general education and a CTE program. Both alternatives last three years and completion of the studies provides eligibility to apply for higher education. About 50 percent of high school students undertake vocational education. There are 52 CTE qualifications and 116 study programs in them. The qualifications aim to provide generic basic vocational skills for work (in any field) and more specialized skills in one employment sector. For every program, 25 percent is core or elective and 75 percent is vocational studies, including about 15 percent in on-the-job learning. As in Norway, a CTE qualification can be obtained either through school-based education or in the form of apprenticeship training. Apprenticeship training is based on an employment agreement (apprenticeship contract) between the student and the

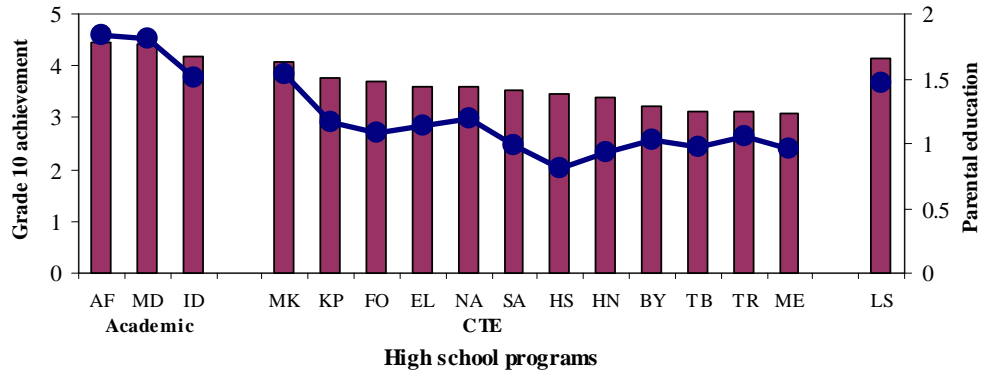
employer, confirmed by the education provider. The completion of a CTE qualification takes three years and provides access to higher education.

In Norway, upper secondary education is split into 15 education programs: three prepare for higher education and 12 are vocational. About 40 percent of the commencing cohort enters general education and 60 percent enter CTE pathways, though it is possible for students to transfer to the general education pathway in order to qualify for tertiary education. As in Sweden, students undertake a set of common core and specialist subjects. Each educational program comprises a more basic first year, and two years of specialisation. Most CTE programs convert the last year of specialisation into two years of apprenticeship training in enterprises. The CTE preparation is based on specific occupations and industries.

As in other countries, there are differences in the types of students entering the various pathways. In Norway, the social backgrounds (as measured by parental education) of pupils in general studies and CTE programs in upper secondary school vary. Figure 3 reports results from seven counties in south-east Norway in the autumn of 2002 (Markussen, 2003). Parents' education (right-hand scale) is based on a measure with 3 as the highest score where both parents attained higher education qualifications, and 0 where neither had qualifications beyond lower secondary. Achievement in Grade 10 (left-hand scale) is a combined measure based on results in 10 subjects on a grading scale from 10 representing lowest achievement to 60 representing the highest achievement. The various high school programs (academic and CTE) are presented along the bottom (names abbreviated to initials), with the full names of each program presented at the foot of the Figure. The achievement level of students who did not enroll in a high school program is also presented (LS). The figure reveals social differences between those advancing to general or academic tracks and those entering CTE programs. The parents of students entering the academic programs (General and Business Studies [AF], Music, Dance and Drama [MD], Sport and Physical Education [ID]) are more likely to have tertiary qualifications than parents of students entering CTE programs. The academic skill levels (based on tenth grade achievement) also vary, with high achievers in Grade 10 more likely to enter one of the academic programs, though there is also considerable variation across the CTE streams.

Outcomes associated with the CTE pathways in Norway also differed (Markussen, Sandberg & Groggaard, 2002). Compared to those who dropped out (LS), those undertaking CTE programs were more likely to enroll in higher education or gain full-time employment, rather than be unemployed. This varied by program, with outcomes from some programs (the more diffuse, less occupationally-specific, with higher proportions of females) similar to those of dropouts (Markussen, Sandberg & Groggaard, 2002). Regression modelling revealed that competence or skill levels as measured by Grade 10 achievement accounted for much of the variation in outcomes across CTE programs.

Figure 3 Achievement and parental education backgrounds, by high school program: Norway, 2002



Source: Markussen, 2003

Codes:

AF=General and Business Studies
 MD=Music, Dance and Drama
 ID=Sport and Physical Education

HS=Health and Social Care
 FO=Arts, Crafts and Design
 NA=Agriculture, Fishing and Forestry
 HN=Hotel and Food-Processing Trades

BY=Building and Construction Trades
 TB=Technical Building Trades
 EL=Electrical Trades
 ME=Engineering and Mechanical Trades
 KP=Chemical and Processing Trades
 TR=Woodworking Trades
 SA=Sales and Service Trades
 LS=Lower Secondary Only

The social patterns in participation across high school programs also appear in Sweden, though social differences have fallen over time. According to Erikson (2007), growth in participation of children from poorer backgrounds has occurred in association with a reduction in the social selection across academic and CTE tracks. Despite these changes, rates of transition from CTE pathways to university and higher education in Sweden remain low (Skans, 2007), though there are positive returns in terms of labor market entry. Studies comparing Sweden with other European countries suggest that social inequality in educational and labor market outcomes in the transition from school to work are least marked in Sweden (Iannelli and Smyth, 2005).

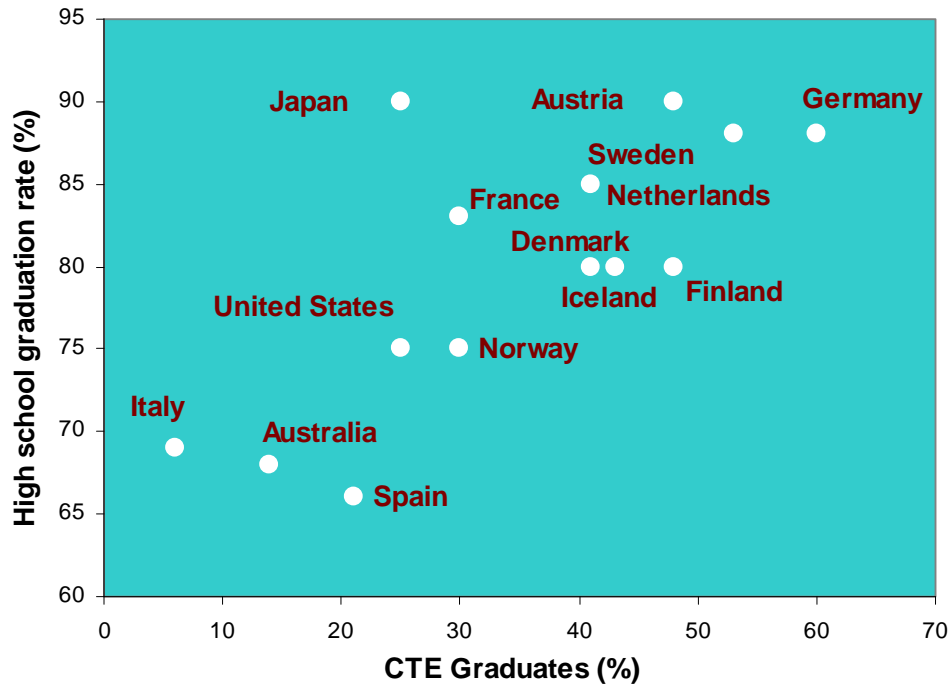
Impact of alternative pathways

There are few robust comparative evaluations of the effectiveness of the various alternative pathways, looking at the questions of differentiation, inclusiveness, and outcomes. It is possible to look in a descriptive way at the relationship between CTE-based pathways and graduation rates across countries by mapping rates of high school graduation by levels of CTE graduates. This information is displayed in Figure 4. The graduation rates presented in Figure 4 are cohort-based rates rather than the OECD measure using the percentage of upper secondary graduates to the population at the typical age of graduation. The rates were derived from reports provided by individual Ministries of Education and National Bureaus of Statistics.⁴

⁴ For a comparison using OECD estimates of graduation, see Bishop and Mane (2004, pp. 384-385).

Figure 4 suggests that the different approaches to providing CTE-based alternative pathways are related, on the surface at least, to differences in overall rates of high school graduation. It shows that there is a tendency for countries that have higher graduation rates to also have higher proportions of CTE graduates.

Figure 4 CTE graduates, by high school graduation rates



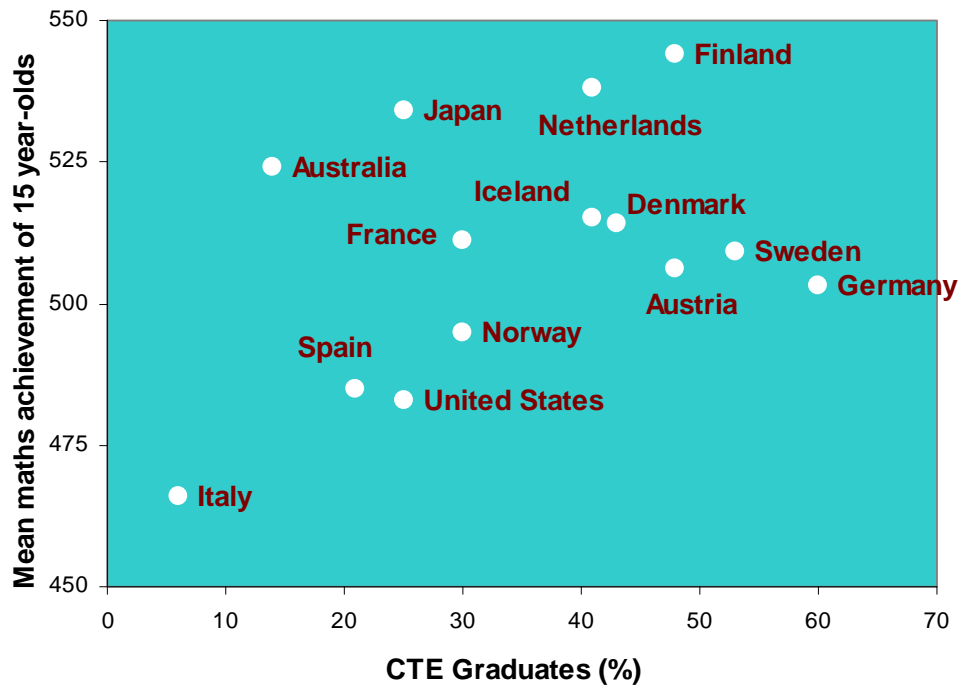
Sources: see list at bottom of Table 3.

The group of nations that offer separate CTE programs or qualifications combining school and workplace learning, such as Germany, Austria, Denmark, and the Netherlands, have the highest rates of high school graduation. Sweden, which offers occupationally-structured CTE programs that also qualify students for higher education, also has a relatively high graduation rate.

Other factors need to be considered before drawing any causal conclusions, but the patterns suggest that systems enrolling more students in CTE alternative pathways tend to have high graduation rates.

Providing CTE-based alternative pathways need not compromise learning and achievement standards. System-wide achievement levels in mathematics for 15-year-olds, presented in Figure 5, show that countries with high levels of CTE graduates also tend to have above average levels of mathematics achievement. Those with the most CTE graduates are performing at or above the OECD average (500).

Figure 5 CTE graduates, by mathematics achievement (PISA)



Sources: Mathematics scores from OECD (2004). For CTE Graduation rates, see list at bottom of Table 3.

Alternative CTE pathways can contribute to social and achievement differentiation within nations. Family background is strongly linked to who enters academic programs and who enters CTE courses; the pathways can promote social stratification. Recent *Education at a Glance* figures (OECD, 2007, p.279) show that in many countries, even after controlling for social and other background differences, achievement levels of CTE students are significantly lower than students in academic and general programs. This suggests that the CTE pathways attract lower achieving students and can also be associated with lower standards of learning and achievement in areas such as mathematics.

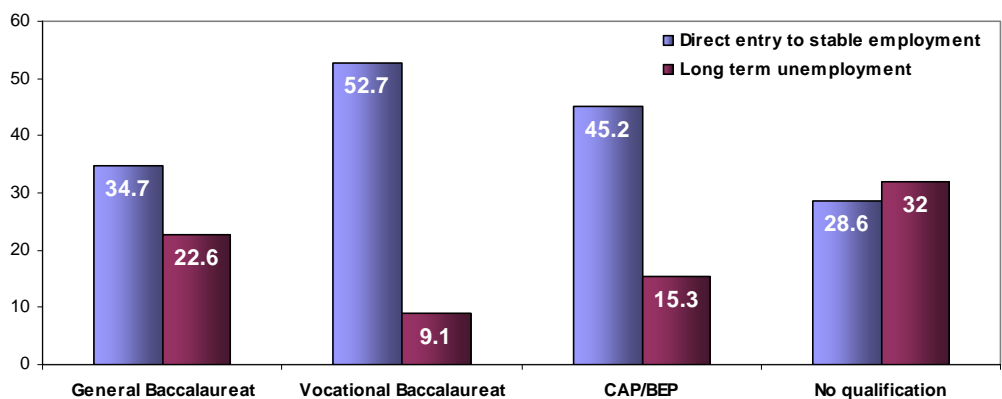
However, in some countries the differences are not significant, and in at least two (Luxembourg and Switzerland) the achievement levels are higher for CTE students. It suggests that alternative pathways need not be a source of relegation and low achievement.

While there are few robust international comparative evaluations of the effectiveness of the various alternative pathways, assessments on the impact of alternative pathways are available on individual systems and they tend to highlight the importance and value of alternative CTE pathways.

Figure 6, for example, shows employment and unemployment experiences of school leavers over seven post-school years in France, by school attainment for a sample of 1998 school leavers (Moncel, 2007). Long-term unemployment refers to those with

either long periods looking for work over the first seven post-school years, or recurrent spells of unemployment over that time. The patterns suggest that school leavers with CTE qualifications, either vocational baccalaureate (9.1 percent) or the shorter CAP and BEP certificates (15.3 percent) are far less likely to experience long term unemployment compared to either those who graduate with a general baccalaureate (22.6 percent) or those who do not gain any upper secondary qualification (32 percent). They are also more successful at gaining early direct entry from school to stable long term employment. The results suggest positive returns to alternative pathways in France.

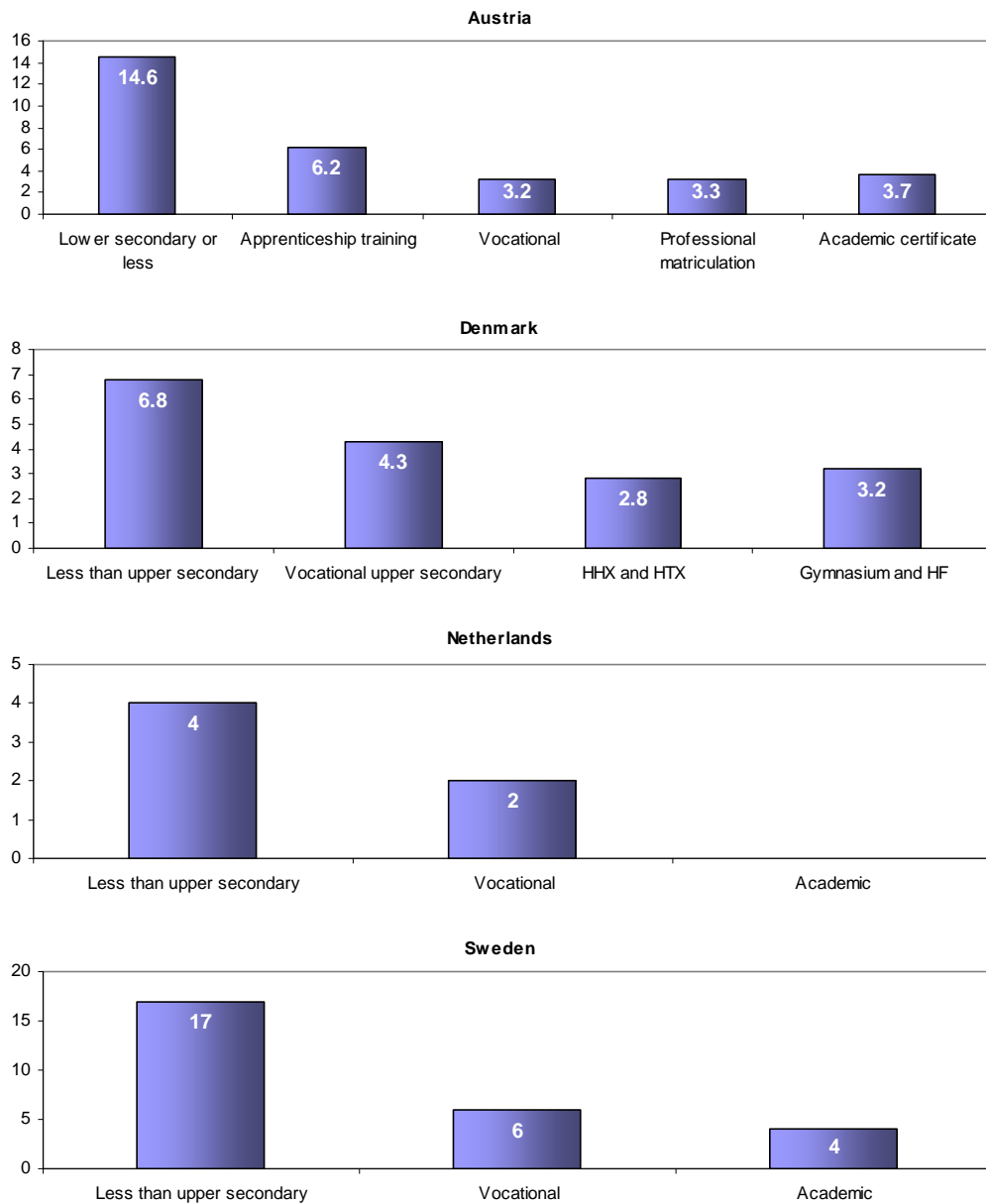
Figure 6 Stable employment and long-term unemployment as main labor market experiences over the first 7 post-school years, by school attainment: France



Source: Moncel, 2007.

The results in France are consistent with patterns in other countries. Figure 7 presents unemployment rates across types of school qualifications for four countries: Netherlands, Austria, Denmark, and Sweden. The results show that in every country high school qualifications are associated with lower rates of unemployment compared to dropouts. The gaps can be quite large. In Sweden, for example, the rates for those with CTE qualifications are almost three times lower than for dropouts. In Denmark and Austria there are also positive effects for CTE qualifications, as well as other non-academic certificates. In Austria, young people with CTE non-apprenticeship qualifications are slightly less likely to be unemployed than those graduating with an academic qualification.

Figure 7 Unemployment rates, by school attainment and qualification type: Austria, Denmark, Netherlands and Sweden (%)



The results for France and the other four nations are consistent with studies in other countries showing positive effects of CTE upper secondary education when compared with lower secondary education or with no qualifications (Payne, 1995; Dearden et al., 2001; Ryan, 2003; Ryan, 2001; Van de Werfhorst, 2002; Gangl, 2003; Silverberg et al., 2004). To an extent, the French results are different in that they show positive returns against school leavers with an academic qualification as well. However, the results on other outcome measures for that country are more consistent, with fewer graduates from CTE than other programs entering higher education, and for labor-market entrants, the CTE effect is not as evident when it comes to earnings or occupational level, at least for those with a CAP or BEP certificate (Moncel, 2007).

Making valid cross-national comparisons of the effects of the three broad types of approaches to the provisions outlined above, in terms of providing the best and most viable pathways for potential dropouts, is not a simple matter partly because there are so few comparisons and little available comparative data that can support robust analytical modelling. In terms of inclusiveness, at a broad system level, the simple comparisons shown in Tables 3 and 4 suggest that despite the high levels of institutional and program segregation, the employment-based CTE model can be inclusive in terms of retaining students in study. The percentage of 15- to 19-year-olds not in education or training is comparatively low in countries that have such arrangements (4.7 percent in Germany, 4.6 percent in the Netherlands and 3.0 percent in Denmark), partly due to the later compulsory leaving age (at least in Germany) and duration of all of its pathways, but also to the diversity of programs that they offer to meet the needs and interests of a wide spectrum of young people. The attainment levels of 20- to 24-year-olds also suggest that these systems do well in getting higher proportions of school leavers to graduate with a high school qualification, even if for the majority this is from a CTE pathway. The highest attainment levels are in the systems that provide separate CTE programs leveling high school, but which retain links with academic or general education and provide avenues from alternative pathways to higher education. Finland, Norway and Sweden have fewer than 10 percent of 20- to 24-year-olds without a high school qualification. Furthermore, these countries have comparatively high rates of graduation from general and academic pathways and strong entry rates into higher education (20 percent or more above the OECD average).

In terms of labor market outcomes, the simple comparisons at a system level shown in Table 4 may reflect at least in part the nature and structure of pathways taken. In every country, the percentages of 20- to 24-year-olds not in education and unemployed in 2004 are larger amongst those who left school without a high school qualification than those who left with a qualification. In some countries the rates of unemployment are quite large. For example, the rates of unemployment in France are comparatively high amongst both groups (23.7 percent for dropouts and 9.8 percent for graduates). Yet, the large gap suggests, particularly when viewed in conjunction with the rates presented in Figure 3, that it owes something to the ability of the CTE pathways in France to connect a proportion of young people to the labor market in the initial school-to-work transition period. In some countries, this is also associated with high rates of transition to higher education, suggesting that the range of upper secondary pathways is providing part of the youth cohort with high quality CTE qualifications combined with university entry certification. Sweden and Finland both have above average rates of entry to higher education, high rates of high school graduation, low rates of social segregation across schools, and gains to high school qualifications compared against dropouts.

It is difficult to conclude much from the comparisons, however, because the results do not separate out the effects of the different alternative pathways in each country. Nor do they take account of differences between the populations of students who did and didn't graduate, which is needed to assess the independent effects of the alternative qualifications. It is not possible to accurately measure effects without more rigorous modelling of the returns to qualifications. Such studies comparing returns to upper secondary qualifications, particularly cross-national studies, are rare. One exception

is the study by Shavit and Muller (1998, 2000). They examined the impact of CTE qualifications on occupational attainment in the early post-school years using data derived from individual country analyses using similar data sets (from the 1980s and 1990s) and methods. Their results are presented in Table 5.

Table 5 Country differences in the effects of CTE qualifications on occupational outcomes for males

	Log chances of entering labor market as skilled rather than unskilled worker		Occupational prestige (standard deviation units)
	Compared to dropout	Compared to academic qualification	Compared to academic qualification
Australia	2.53	2.57	0.04
United Kingdom	1.72	0.62	-0.15
France	1.54	0.45	-0.28
Germany	3.05	na	-0.30
Italy	1.11	0.22	-0.16
Netherlands	1.14	1.10	-0.36
Sweden	0.59	0.52	-0.51
United States	0.71	0.20	-0.11

Source: Shavit & Muller, 2000.

The results in the first two columns report the log odds ratios of getting a first job as a skilled rather than unskilled worker. The numbers are a way of representing the probability of gaining skilled work rather than unskilled work, presented as the logarithm of the odds ratio. The larger the number, the stronger the effect of CTE courses in helping graduates gain a job as a skilled worker. The results suggest that in most countries CTE qualifications have positive effects compared against dropouts (young people who do not gain any school qualifications), though not in Sweden or the United States. There are mixed patterns when effects of CTE qualifications are compared against academic education. In the Netherlands and Australia they are positive for CTE qualifications suggesting that there are gains to CTE training in school. In all of the other countries, the results favour academic education. The same is true in looking at the results for occupational prestige (the social standing or status of occupations). The authors claim that the differential effects of CTE education are in part related to differences in institutional characteristics and program design, with effects bigger in countries where programs have a strong occupational specificity and where there are strong linkages with labor market organizations (Shavit and Muller, 2000). It is important to note that the results relate only to the first job on entry to the labor market and may not reflect longer term career effects. CTE effects in career beginnings may be short-lived as students who gained academic training take advantage of better career advancement. No account is taken of rates of entry to higher education and further study. Furthermore, in some countries, such as Australia, the data relate to periods when CTE in schools was undeveloped and involved only very small numbers.

A more recent study of four countries by Iannelli and Raffe (2007), examined employment outcomes for young people making the transition from school to work in

four countries: Netherlands, Ireland, Scotland, and Sweden. They compared outcomes according to different types of school qualifications and across countries. The study included calculations of the probabilities of employment outcomes controlling for country, qualification-level and grades. The findings revealed that at a broad level CTE qualifications were more likely than lower-secondary education to lead to participation in post-secondary education (at least for males). CTE options were less likely than academic qualifications to lead to study in post-secondary education. There was a positive CTE effect for entry to employment rather than unemployment when compared with dropouts, but no effect in comparison with academic graduates. They also reported differences across countries, with the CTE effects appearing stronger in the country that emphasised employment-linked or based CTE programs (the Netherlands).

Post-school alternatives for dropouts

Despite the range of alternative programs and qualifications in high school provided to encourage more young people to remain in school and graduate (even if the notion of graduation and the qualifications vary considerably across countries), most countries have proportions of students who drop out and these can be sizeable. The rates vary across countries, though it may not be possible to know the full extent using figures provided by the OECD publication *Education at a Glance* (EAG). The published graduation rates are estimated by dividing the number of graduates by the population at the typical graduation age. This can lead to distortions. For example, Germany had an estimated graduation rate of 99 percent in 2003, according to this method (OECD, 2006). However, figures from the German Federal Ministry of Education and Research indicate that in that year nine percent of school leavers left without having completed a lower secondary qualification, and an additional three percent without having completed upper secondary (Federal Ministry of Education, 2005, Table 2.2). Alternatively, using the OECD method the reported rate for Sweden in 2003 was 78 percent, though according to official Swedish administrative records the percentage of native born 20- to 24-year-olds without an upper secondary qualification was only 12 percent (Statistics Sweden, 2006).

Some countries have substantial numbers of dropouts who do not gain any high school qualifications before leaving school. In Australia it is about 30 percent (Lamb et al., 2004). In the United Kingdom, one estimate places the rate at about 25 percent, though much higher if it includes those who obtain General Certificate of Secondary Education — end of compulsory education — results only (National Statistics, 2006). For the Netherlands the level is around 15 percent, with a rate of 10 percent for those entering CTE pathways and four percent for those in general or academic programs (van De Steeg and Webbink, 2006; Ministry of Education, Culture and Science, 2007). In Denmark and Finland it is about 10 percent (Ministry of Education, 2005; Statistics Finland, 2007), in Spain over 30 percent (Ministry of Education and Science, 2006), and in France around 17 percent (Moncel, 2006).

Systems have responded to the problem of dropout in different ways. Some have resorted to legal and rather blunt measures by increasing the compulsory school leaving age, a measure which may keep students at school, but does not guarantee successful graduation, in part because it does not address the reasons why young

people want to quit school in the first place. But many have responded by strengthening or putting in place opportunities for dropouts to gain high school equivalent education and training qualifications after quitting school. These external or post-school alternative pathways provide opportunities for study and graduation mainly through a range of educational or employment-based schemes. Some of these measures are sometimes criticised for their potential to encourage or induce young people to drop out of school, young people who may otherwise have remained in school and obtained a school qualification. One pattern that may reflect this is the gender difference in dropout rates. The tendency for males to drop out of school at a greater rate than females in some countries may be linked to the availability of a wider range of alternatives for males, such as apprenticeships, as well as changes in labor demand (for example, in Australia, see Lamb et al., 2004). Some alternatives may work this way; however, systems face a critical dilemma: students may choose to drop out even if alternatives are not available. With large existing numbers of dropouts in an era where skills and education are more important than ever, can systems afford to restrict opportunities for young people to re-engage in study? Some econometric modelling of alternatives in the United States suggests that while alternative schemes may encourage some to drop out, their removal would not necessarily produce major reductions in dropout rates (Agodini and Dynarski, 2000; Tyler, 2003).

This section will look briefly at some of the main alternative pathways providing high school equivalent qualifications for dropouts. There are three main categories examined: firstly, those that are equivalent upper secondary credentialing programs, those that provide employment-based education and training pathways such as apprenticeships, and those that involve education-based qualifications through formal post-secondary institutions.

Upper secondary credential equivalents

Some systems have developed equivalency credentialing programs for young people who do not gain a school-based diploma or certificate. The programs represent equivalents to the general or main high school graduation qualifications. There are two main examples. The first is the General Educational Development (GED) tests in the United States and Canada. The GED is a series of tests that can be taken by those who have not gained a high school diploma and who, if successful, can then be awarded with a qualification that attests to their having achieved high-school level academic skills. It is awarded to those who receive passing scores on a battery of tests in writing, social studies, science, reading, and mathematics.

The second scheme is the high school graduation proficiency qualification test in Japan. It is similar to the GED in that it is open to those who have not gained their high school diploma (usually those who have been truant from school or home schooled) and it aims to assess the level of skills across key subject areas to high school graduation level. The examination gives young people the opportunity to be certified that they have an academic ability equivalent to mainstream high school graduates. Success in the tests gives candidates the opportunity to then take the competitive university entry examinations.

In the United States, according to recent figures, about nine percent of school leavers successfully complete a GED within eight years of leaving school (National Center for Education Statistics, 2004). Studies on returns suggest that those who get a GED are less likely to go to college than those who obtain a traditional high school diploma, and they have lower earnings in later life (Cameron and Heckman, 1993; Murnane et al., 2000; Rumberger and Lamb, 2003). Murnane et al. (2000) estimate that about 30 percent of GED recipients had entered college by age 27 compared to 69 percent of those with a regular diploma. Recent work suggests that in terms of returns the benefits of completing the GED work differently depending on skill levels, providing benefits mainly to those dropouts with the lowest cognitive skills. For dropouts with stronger skills, completion of the GED is not associated with higher earnings (Boesel et al., 1998; Murnane et al., 2000; Tyler, Murnane, and Willet, 2000). While the returns for those who gain a GED may not be as positive as for those who achieve a high school diploma, GED certification does play a role in the educational attainment of high school dropouts (a point made by Maralani, 2006). Many dropouts resume their schooling at some point and go on to earn a GED. According to a study by the National Center for Educational Statistics (1998), those who gain a GED are three times more likely to enter a post-secondary institution than dropouts who do not earn a secondary school credential.

Trade qualifications

In some nations, apprenticeship training is an important pathway for school dropouts. While in countries such as Germany and Austria, through the dual system, apprenticeships are part of the general high school system, in other countries such as Canada, Australia, and the United Kingdom, they are generally provided as post-secondary education and training. Apprenticeship-type programs generally involve an indenture or contractual agreement with an employer where a young person is expected to undertake a period of formal training in a classroom setting, sometimes referred to as *block release*, as well as on-the-job experience. The programs are designed to equip young people with the skills associated with a particular craft or trade and to provide certification through widely recognised qualifications. In most systems, apprenticeships are a structured program of vocational preparation, sponsored by an employer, involving both part-time education with on-the-job training and work experience, leading to a recognised CTE qualification, and taking up to four years to complete. Such schemes are often appealing to young people who drop out of school because they provide a wage while learning (often a training wage, and usually below average earnings for young people not in training). They also involve the acquisition of skills through applied learning in workplaces, again often appealing to dropouts who have become disengaged from formal classroom learning in school settings, providing an alternative for young people not attracted by full-time school. Formally, most systems provide the possibility for moving to higher levels of training after completion of apprenticeship qualifications, though actual progression rates are often low (Eurostat, 2001).

Apprenticeships and apprenticeship arrangements vary widely across nations. In some countries, such as the United States, apprenticeships are less well developed as a system of training for young people, organised around a smaller number of occupations and mainly operate for young adults; therefore, they play less of a role for

dropouts. In other systems, such as Australia, they are the major form of education and training available to dropouts. Across nations, apprenticeship programs vary on such matters as length of training (from six months to four years), how they are entered (through employment contract or formal college enrollment), the requirements around formal learning (initial period of formal training, or on-going mixture of workplace and classroom training, for example), time in the workplace, and areas of training. The traditional model of apprenticeship in many systems has been a four-year indenture in a traditional craft area such as electrical trades, plumbing, carpentry, and automotive trades. However, there have been major reforms in several countries, expanding the areas of occupational training and the length of training. In Ireland and Australia, for example, traineeships have been introduced which provide training in white-collar occupations, such as clerical work (National Economic and Policy Forum, 2005; Dockery et al., 2005). The traineeships are usually for 12 months rather than four years. Modern apprenticeships in the United Kingdom can be short in duration — less than 12 months — and resemble more a program of youth training rather than a formal apprenticeship indenture program (Ryan and Unwin, 2001; Ryan, 2001).

The evidence available to compare the effects and value of apprenticeships as a pathway for dropouts across nations is meagre. There is evidence available on individual systems comparing the relative merits of apprenticeships compared to other qualifications, though. In Australia, for example, the national school dropout rate (numbers of young people entering secondary school and leaving without having gained a senior school qualification) is about 30 percent, 36 percent for males and 24 percent for females (Lamb, Long & Baldwin, 2003). In the 1990s, up to 36 percent of male dropouts took up an apprenticeship and 28 percent gained a qualification by age 24 (Lamb, Long and Malley, 1998). For females the rate of take-up was about eight percent and the qualification rate was about six percent. Recent figures suggest similar levels. The Australian Traineeship System extends structured training programs to a wider range of occupations than those represented by apprenticeships. Like apprenticeships, traineeships provide wages, but these are usually lower than those of apprenticeships, and traineeships generally provide one year of training rather than four. About 12 percent of male dropouts gain a traineeship qualification and about nine percent of female dropouts do.

Returns to apprenticeships in Australia appear favourable for male dropouts. Regression estimates of the length of time unemployed at age 24 suggest that males gaining apprenticeship qualifications spent significantly less time unemployed than dropouts without qualifications and those with other types of vocational qualifications (Lamb, Long and Malley, 1998). The rate was similar to those for high school graduates. The trends were similar for females with apprenticeship qualifications though the gaps were not significant. In terms of earnings, average weekly earnings regression equations for 24-year-old full-time workers suggest that males who completed apprenticeships earned 10 to 11 percent more than male 24-year-old graduates who had not undertaken any post-school education or training. The wage benefits for females were lower, with female apprenticeship graduates earning two percent more than 24-year-olds who had graduated from high school without undertaking any further study.

The effects may hold over careers. Borland et al. (2000) estimated returns using the results of a wage regression equation for male weekly earnings from 1997 data. The equation was estimated for employed males (full and part-time) aged 18 to 59. Their estimates suggest that those with trade or apprenticeship qualifications earned marginally less than high school graduates (three percent less), but they earned significantly more than dropouts without post-school qualifications (14 percent more).

Evidence from other countries suggests some differences in effects. In France, compared to other labor market entrants, apprentices are likely to have more stable early labor market experiences, spending more of their early working lives in employment compared to other labor market entrants, though their pay is lower at the end of five years (Bonnal, Fleury and Rochard 1999). In the United Kingdom, apprenticeship graduates tend to have higher employment rates, though only for moderate and low achievers (Payne, 1995). They also tend to have higher earnings, but only for males (Payne 1995). In several countries, apprenticeship training appears to do less for women than for men, in terms of entry rates, occupational access and subsequent labor market outcomes. This may be because there is considerable gender segregation in the areas of apprenticeship training, consistent with patterns of gender segmentation in occupations and labor markets.

In sum, apprenticeships provide an important alternative pathway for school dropouts. Compared to those who attempt to enter the labor market without post-school education and training, apprenticeship graduates enjoy benefits in terms of stable employment, less risk of unemployment and higher earnings. Apprenticeship shows up particularly well in such comparisons, being associated with gains in pay as well as employment. The returns may not hold up as well compared against mainstream high school qualifications, but for male dropouts the evidence suggests that they are an important avenue of successful transition from school to full-time work.

CTE qualifications

Another major avenue for obtaining alternative qualifications for school dropouts is the range of CTE qualifications usually offered through tertiary institutions such as further education colleges, polytechnics and community colleges, depending on the country. Increasingly across many countries, more and more young people have come to rely on post-school education and training as they make the transition from school to work. As a result, the numbers of school leavers who enter employment without participating in some recognised form of further education or training have declined. Dropouts in particular are largely dependent on available education and training opportunities to gain workforce preparation skills and qualifications that can assist them in the labor market. It is through the tertiary education and training system that dropouts who struggle to find work need to acquire the skills required to help them get jobs and the high school equivalent qualifications that can help make them competitive in the workforce. The CTE tertiary sector can comprise a vast number of public and private providers catering to the needs of a wide range of clients. The principal role, in terms of dropouts, is to help provide alternative pathways through which dropouts can enter study, gain qualifications and pursue work as well as proceed to higher levels of CTE and general study within the vocational or the higher education sector.

As with apprenticeships, the evidence available to undertake international comparisons of CTE qualification alternatives for dropouts is meagre. Data on individual systems looking at comparative returns to qualifications are more available. One such study in the United Kingdom was undertaken by McIntosh (2004) who studied the outcomes of the CTE qualifications pathways for the 25 percent of school leavers at 23-25 years of age who had dropped out of school without any qualifications. The study took data on the cohort of individuals who left school in 1993, 1994 and 1995, and examined their further education decisions and early labor market outcomes. The results revealed that 56 percent of male and 54 percent of female dropouts gained at least one CTE qualification by their mid-20s. CTE qualifications are provided at different levels associated with length of study and depth of skills training, with CTE Level 3 qualifications equivalent to 'A-levels' (academic high school subjects). Table 6 shows the proportions of dropouts gaining qualifications at each level from Level 1 (low) to Level 3 and above (high).

Table 6: Qualification pathways of 23-25 year-old dropouts: United Kingdom

No school qualifications	Males (%)	Females (%)
+ none	44.1	46.1
+ vocational level 1 (GCSE D-G standard)	30.7	29.9
+ vocational level 2 (GCSE A-C standard)	11.1	10.8
+ vocational level 3 (A-levels)	5.4	4.1
+ above level 3	8.7	9.1

Source: McIntosh, 2004

The analysis then went on to show that CTE qualifications can significantly impact labor market success, with the group of unqualified school leavers being much less likely to be employed than both dropouts who later gained CTE qualifications, and school leavers who had obtained upper secondary qualifications at school (see Table 7). The analysis shows that those unqualified dropouts who do obtain CTE Level 2 or 3 qualifications are much more likely to be in employment than those who do not, their employment likelihood closing significantly on that of those individuals who reach these levels via the academic route at school. To a lesser extent, the wage gap also closes with CTE qualification acquisition, at least for initially unqualified males.

Results obtained in similar studies undertaken for dropouts in Australia are more equivocal. As in the United Kingdom, CTE qualifications in Australia are provided at different levels associated with length of study and depth of skills training. Basic and middle-level CTE qualifications, which are the main qualifications undertaken by dropouts in their initial post-school years, are associated with weak, sometimes negative, employment and earnings returns compared against school graduates and little advantage over dropouts who do not undertake any further study (Lamb, Long and Malley, 1998). This is not the case with higher level CTE qualifications which show positive returns, but the participation and graduation rates for dropouts at these levels are low. In the 1990s, approximately 18 percent of male dropouts gained basic or middle level CTE qualifications by age 24, with three percent of male and seven percent of female dropouts gaining high level CTE qualifications.

Table 7: Employment and earnings of 23-25 year-old school leavers with no qualifications: United Kingdom

	Females		Males	
	Employed (%)	HRLY wage	Employed (%)	HRLY wage
No school qualifications				
+ none	30.6	5.53	68.2	6.05
+ vocational level 1	58.3	7.35	75.3	7.25
+ vocational level 2	70.3	5.44	88.7	7.14
+ vocational level 3	77.4	5.79	94.3	6.22
+ above level 3	93.5	8.23	77.9	9.45
High school qualifications				
+ none	83.9	6.87	94.4	8.14
+ vocational level 1	90.6	7.81	91.5	7.38
+ vocational level 2	78.0	6.69	94.8	7.98
+ vocational level 3	90.5	8.19	95.8	8.18
+ above level 3	92.0	8.85	91.6	10.03

Source: McIntosh, 2004

Figures are available on rates of entry to post-secondary education and training for dropouts in other countries (see for example, Berktold et al., 1998, for results on the subsequent educational attainment of dropouts in the United States, and Human Resources Development Canada, 2000, for Canadian estimates). However, data are not readily available to assess the outcomes of gaining alternative qualifications.

Conclusion

Historically, the development of the comprehensive high school and the *high school diploma* in the United States led the world in providing an architecture for upper secondary education that was inclusive and could promote mass rates of graduation. This did not mean that the largely elective-based model did not continue to act as a powerful mechanism of social stratification, but it did help provide a system of mass delivery well in advance of other systems. Today, however, it is a different picture. Rates of graduation have become stable, entrenched, whereas in other countries the rates have continued to grow with some systems now achieving almost universal upper secondary graduation rates.

Over recent decades, many western nations have stepped up their efforts to reduce the numbers of school dropouts by providing alternative pathways to graduation. How school systems have approached this, and how successful they are, varies. In some systems there is a menu of separate certificates and qualifications, each tied to a different strand of learning, and each representing a different pathway. In other systems there is a single certificate or qualification (such as a high school diploma), but with structured options producing academic, general and vocational tracks that work as pathways to different post-school options.

Improvements in some countries have been partly achieved through developments based on the United States model. The Nordic countries — Sweden, Norway, and Finland — have all reformed their secondary school systems implementing a comprehensive school model. In addition, during the 1980s and 1990s, these three nations implemented a number of educational reforms focusing largely on CTE as a means of encouraging students to stay in school. The approach in Sweden, for example, involves a group of CTE and general programs incorporated into a single school certificate. There are 14 CTE programs, structured around different occupational fields. All programs have a number of common subjects (broad-based general education) as well as generic and specialist options within vocational fields. The structure bridges the divide between CTE and general education by providing a stronger initial foundation in the early stages of all programs to prepare students for further learning. Foundation learning is followed by specialised training. Assessment is continuous with successful completion involving national tests for core subjects. Sweden has a fairly high proportion of CTE graduates (over 50 percent), and a comparatively high overall graduation rate.

Despite these improvements, social differences in program participation still exist, as in the case of Norway (see Figure 3). However, where the choices students make about programs are left until the end of the junior high school years (Grade 10), such as in Norway and in Finland, then the social stratification associated with program diversification in the senior high school years tend to be less marked.

Another key approach to dealing with the issues of pupil diversity and dropout is through offering an array of programs leading to separate qualifications, rather than a single certificate. National models that deal with the problem of pupil diversity through institutional, program and certificate diversification — providing alternative pathways through separate qualifications or certificates (academic, vocational, technical, specialist) — can also successfully promote high rates of graduation. Austria and Germany are good examples; they achieve overall graduation rates close to 90 percent. CTE graduates make up the majority of high school graduates. Both systems have frameworks that find a place for everyone, though the places are not necessarily of equal value in terms of access to knowledge and learning and outcomes. They are also based on early selection, with students grouped along different school and program paths well before the senior years. The system is based on a selective rather than comprehensive school model. Social divisions across the different levels of qualifications in such systems can be marked. There is no intrinsic reason why this is so, why institutional and program diversification should necessarily lead to greater variation in outcomes or to greater social stratification. It may be that the dominant position occupied by the academic curriculum in such arrangements and its treatment works to stratify other positions in the hierarchy of upper secondary opportunities (all other positions are in a sense relative to it) and the academic selection that is at the base (fortified through the separation of students into different schools or streams) favors children from higher SES backgrounds. Inclusion comes at the cost of relegation for the disadvantaged. This leads to weaker opportunities for social mobility and a greater tendency for the reproduction of social differences in education across generations.

Alternative CTE pathways can contribute to achievement differentiation within nations. For example, in many countries achievement levels of CTE students

consistently tend to be lower than students in academic and general programs (OECD, 2007). This may be because CTE programs attract lower achieving students, though it may also be because of lower standards of learning and achievement in areas such as mathematics. However, in some countries the differences are not significant and in at least two achievement levels are higher for students in CTE programs. It suggests that alternative pathways need not be a source of relegation and low achievement.

Across nations, there is evidence to suggest that countries which offer students more opportunity to undertake CTE programs have stronger overall graduation rates. Countries that have a large share of CTE graduates tend to have higher graduation rates. This is important to consider in the context of addressing the problem of dropout. But it is not only the benefit alternative pathways have in retaining students in high school. There is evidence from several countries, including France (vocational baccalareate, CAP/BEP), Sweden and Denmark, to show that students graduating with CTE qualifications can do better in the transition to the labor market, in terms of avoiding unemployment at least, than students without high school qualifications and sometimes even against students from academic pathways.

The challenge in raising graduation rates is to ensure quality and consistency in the standards of learning for all students across all programs. Some nations have been more successful in doing this than others, but providing rigorous and meaningful alternative pathways with career and technical education seems to be the key.

Some countries continue to experience high dropout rates. In this context there is a need for nations to consider the opportunities they provide for young people no longer in school to re-engage in study and gain upper secondary equivalent qualifications. The main avenue for dropouts in the United States is the GED. Other nations have much stronger employer and employment-based post-school training opportunities (including apprenticeships, but also other forms of employment-based CTE qualifications) which work well for dropouts, providing viable alternative pathways. Evidence on apprenticeships, for example, suggests that they can produce positive employment and earnings outcomes for school dropouts who later enter this form of training. Such alternatives are important to help re-integrate dropouts into the education system while providing them with occupational skills and experience that can assist in the transition from education to work.

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