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Innovation in Career Pathways Across Five Countries

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This working paper has been authorised by Andreas Schleicher, Director of the Directorate for Education and Skills, OECD.

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Abstract

Since the Great Financial Crisis (2007–08) many countries have explored how education systems can better prepare students for their working lives in order to reduce youth unemployment and enhance educational engagement and achievement. This paper focuses on Career Pathways, learning programmes delivered in general secondary education that allow students to undertake a deep exploration of a vocational field of interest while keeping their options for the future open. In a first-of-its-kind analysis and building on understanding of historic provision, the study considers innovation in programme development in five predominantly Anglophone countries (Australia, Canada, New Zealand, Scotland and the United States) since 2010. While historically participation in Career Pathways has been strongly associated with better employment outcomes for learners, evaluations have highlighted important challenges to their delivery at scale for the full range of learners. This paper reviews a range of responses to historic challenges based on study visits to five countries and closes with policy recommendations for future enhancement of provision.

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1. Introduction

1.1. Career Pathways as intensive and inclusive career preparation

The focus of this paper is on programmes of secondary education designed to enhance the career outcomes of students by integrating a substantive, exploratory introduction to working life into general education. Known in some countries as Career Pathways, such programmes are typically offered to students within educational institutions offering general education at upper secondary level (most commonly, at ISCED level 3). Career Pathways have a long history of provision, notably in Australia, Canada and the United States and have been evaluated positively in terms of their impact on students' employment outcomes. Driven by multiple concerns over the efficacy of secondary education, and in particular upper secondary education, in meeting the contemporary needs of young people and economies, Career Pathways are designed to offer intensive and inclusive forms of career preparation. Focused on areas of broad economic activity, often vocational fields that are strategically important with high demand for labour, Career Pathways provide students with opportunities to investigate potential future employment, to build relevant knowledge and work-based experience and to interact with people working in linked professions while keeping their options open for post-secondary engagement. In the United States (Box 1), students are encouraged to achieve at least one post-secondary work-related credential or post-secondary academic credits through participation in a Career Pathway.

Box 1. US federal government definition of Career Pathways Systems

The federal Workforce Opportunity and Innovation Act of 2014 defines Career Pathways Systems as "a combination of rigorous and high-quality education, training, and other services that—

A. aligns with the skill needs of industries in the economy of the state or regional economy involved;

B. prepares an individual to be successful in any of a full range of secondary or postsecondary education options, including registered apprenticeships;

C. includes counselling to support an individual in achieving the individual's education and career goals;

D. includes, as appropriate, education offered concurrently with and in the same context as workforce preparation activities and training for a specific occupation or occupational cluster;

E. organizes education, training, and other services to meet the particular needs of an individual in a manner that accelerates the educational and career advancement of the individual to the extent practicable;

F. enables an individual to attain a secondary school diploma or its recognised equivalent, and at least one recognised postsecondary credential; and

G. helps an individual enter or advance within a specific occupation or occupational cluster (GAO, 2022[1])"

Source: Career Pathways Systems (U.S. Department of Education[2])

Career Pathways differ from traditional general education in their design and delivery. They are routinely enriched by substantive work-related and work-based learning and commonly taught through more collaborative and project-based learning. Often delivered over two to three years, students often spend one to two days a week focused on a broad vocational field, such as engineering or construction. At the completion of their studies, students can expect to attain a general qualification related to their secondary education and to be well placed to either continue their studies in post-secondary education or enter employment or post-secondary vocational training directly.

Recent years have seen an increase in the adoption of Career Pathways within upper secondary education, notably (but not exclusively) within education systems where students commonly stay in general education until the end of secondary schooling. They are less common in societies where early entry to programmes of Vocational Education and Training (VET) is the norm. Policy motivations for the development of Career Pathways are multifaceted. One key motivation is a strong desire to enrich secondary provision by offering all students greater choice in both the focus of their studies and how they study. In this way, it is hoped that they will improve the schooling experience and achievement of students, including for lower achieving students facing social disadvantage and expecting early entry to the labour market. Career Pathways are however also commonly intended to be relevant to higher achieving students planning on entering competitive professional careers via post-secondary education. Consequently, Career Pathways are often seen as contributing to greater equity within educational provision by providing students with a wider range of possibilities to succeed. More broadly, the introduction of Career Pathways speaks to a desire to better prepare students for working life by providing educational experiences that draw more heavily on the reality of employment within a rapidly changing labour market. As a form of career development, Career Pathways are designed to provide a safe place for students to investigate potential areas of employment in detail, helping them to make informed decisions as they approach the end of secondary schooling.

Since the Great Financial Crisis of 2007-08, which led to a spike in youth unemployment in many countries, there has been strong interest in Career Pathway programmes, and the architects of Career Pathway programmes anticipate that greater numbers of young people will leave secondary education well placed to participate successfully within society. Consequently, policy innovation is commonly shaped by economic and social needs. Career Pathways are often focused on areas of strategic skills shortages. Typically designed with employers and professional bodies, these programmes are intended to smooth transitions into employment, providing students with relevant and up-to-date knowledge and experience that will make them more attractive to potential future recruiters. It is expected that the graduates of Career Pathways can achieve better employment outcomes in the early labour market, and an analysis of longitudinal data in multiple countries suggests that this is routinely the case. Students whose secondary experiences included participation in both Career Pathways and forms of career development commonly found within such programmes, notably with regard to employer engagement, are frequently seen to be more successful in finding employment, enjoying higher wages and/or demonstrating greater job satisfaction than comparable peers (Covacevich et al., 2021[3]).

This study represents the first comparative description of the implementation of this approach to learning across five countries: Australia, Canada, New Zealand, Scotland, and the United States. In particular, it focuses on more recently developed Career Pathways, launched or significantly enhanced within the last decade. Through on-site visits, document reviews, and follow up interviews, the project team engaged over 500 policymakers, practitioners, and students across these five countries. Eight specific programmes, with varying characteristics, were explored in detail. This paper places such programmes in

historic and national context, highlights results from relevant empirical studies, and shares insights from programme design and delivery teams on more effective approaches to enabling successful provision.

The rest of this working paper is organized as follows. Sections 1.2 and 1.3 complete the Introduction by describing the methodology and explaining where Career Pathways lie on a work-based learning continuum. Section 2 provides background on the countries engaged in the study, highlighting similarities in youth unemployment trends post-Great Financial Crisis and the small size of vocational education and training (VET) systems, as well as variations in policy responsibilities and school system sizes. Section 3 offers a historical perspective on models integrating career readiness into secondary education that began before 2010, while Section 4 reviews the theory and evidence linking Career Pathways programmes to post-secondary employment outcomes. Together, Sections 3 and 4 suggest that career development in secondary education can be commonly expected to lead to positive employment outcomes but that relevant career guidance programmes have historically been limited in availability and quality. Section 5 examines recent expansion and innovation in Career Pathways, from the driving policy motivations to innovative international approaches. Section 6 compares the eight programmes that are the focus of this study, highlighting objectives to offer new provision that offers greater student choice, more coherent learning journeys, deeper employer engagement, and richer learning experiences, supported by stronger cross-school coordination. Section 7 discusses recurring challenges such as implementing and scaling ambitious change and making programmes attractive and effective for all students while ensuring equitable access, exploring how programmes have addressed these issues. Finally, Section 8 presents seven lessons for countries developing their own Career Pathways programmes.

1.2. Methodology and data

This paper draws on qualitative insights into the design and delivery of programmes from national to institutional level. Study visits were undertaken to Australia (New South Wales and Victoria), Canada (British Columbia and New Brunswick), New Zealand (Auckland and Wellington), Scotland (Aberdeen and Glasgow) and the United States (Delaware and Texas). Specifically, this review focused on the development and delivery of eight programmes across five countries (Table 1).

Table 1. Career Pathway programmes reviewed within this paper

Australia	Head Start School-based Apprenticeships and Traineeships (Victoria)
Canada	Essential Skills Achievement Pathway (New Brunswick) South Island Partnership (British Columbia)
New Zealand	Manurewa High School programmes Westlake Girls High School STEAM programme
United Kingdom (Scotland)	Foundation Apprenticeships
United States of America	Delaware Pathways (Delaware) Rural Schools Innovation Zone (Texas)

In all, the study team engaged directly with over 500 policymakers, practitioners, students, employers, and other partners at national, subnational and institutional levels. The majority (260) were students in schools and workplaces.

Table 2. Profile of interviewees engaged in this project

Function/Role	Australia	Canada	New Zealand	Scotland	United States	Total
National or federal government	2	0	6	6	5	**19**
State or provincial (subnational) government	44	9	0	2	13	**68**
Higher education institutions	6	5	0	4	6	**22**
Secondary schools, including educators	34	19	18	10	30	**111**
Students	25	52	36	46	101	**260**
Employers	2	0	1	1	5	**9**
Other non-governmental partners	2	0	0	5	5	**17**
Total	**116**	**85**	**61**	**74**	**170**	**506**
Schools	5	4	5	4	9	**27**

In addition, stakeholders in the design and delivery of Career Pathways were surveyed in all five countries, encompassing an array of roles. In each of the five countries, a survey was sent to a non-representative set of respondents with the intent of gaining more detailed information from individuals with knowledge of relevant Career Pathways programmes. The data from these surveys was used to substantiate or expand upon what was observed in policy reviews and interviews. Survey respondents included programme administrators from all educational levels, practitioners such teaching staff and career counsellors, policymakers from ministries of education, non-profit advocates, researchers and workforce development representatives.

Table 3. Profile of respondents surveyed for this project

Function/Role	Australia	Canada	New Zealand	Scotland	United States	Total
Administrator	4	2	3	1	30	**40**
Practitioner / Educator	3	16	6	2	4	**31**
Policymaker	1	0	0	3	2	**6**
Non-profit / Advocacy	0	1	3	0	16	**20**
Workforce Development	**0**	1	2	2	7	**12**
Other	**0**	1	1	0	3	**5**
Total	**8**	**21**	**15**	**8**	**62**	**114**

Note: Administrator: Career Pathways programme administrator at national, state/province, local, district, or school level. Practitioner: Career Pathways educator, career counsellor, or instructor at secondary school, vocational & technical centre, or higher education. Policymaker: Official engaged in setting Career Pathways-related policy, regulation, or standards; typically in ministry of education or equivalent and typically at a subnational level. Non-profit / Advocacy: Researcher, technical assistance provider, or advocate based at community-based organization, education advocacy group, philanthropy, or other non-profit interest group. Workforce Development: Representative of training or work placement centre. Other: Employer, consultant, economic development agency representative, or technical assistance provider not classified elsewhere.

The paper additionally draws on a review of policy and research literature focused on Career Pathway development, notably focusing on studies presenting empirical evidence on the long-term impacts of such programmes, updated from (Covacevich et al., 2021[3]) and discussed below.

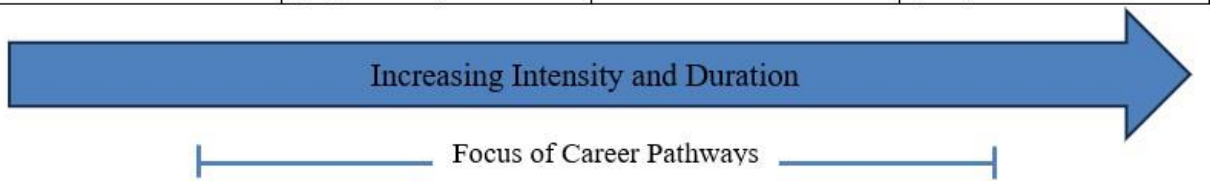
1.3. Locating Career Pathways in a continuum of career development

Career Pathways sit at the nexus of academic learning, vocational learning, and career exploration and can be located within a continuum of career development and vocational preparation. The Work-based Learning System Continuum developed in the United States provides a useful means of locating Career Pathways as forms of secondary career development (ConnectED, 2021[4]). The continuum draws on long-standing conceptualisations of career-related learning (Huddleston and Stanley, 2012[5]) that highlight three potential primary learning approaches: learning about work, learning through work, and learning for work. In all cases, learning outcomes can be optimised through first-hand engagement with the world of work.

As Figure 1 illustrates, secondary systems around the world implement work-related and work-based learning experiences ranging in intensity and duration from lighter touch experiences such as job fairs, in which students can learn about different careers in a large group setting, to more hands-on experiences, in which students are fully immersed in a programme of learning designed to develop occupationally specific skills. Career Pathways exist in the central portion of the continuum. While some students might engage in some occupationally specific training within their provision through work-based learning experiences, Career Pathways are primarily exploratory programmes where students maintain their presence in a general education setting, keeping their options open to the full range of post-secondary choices. The work-based learning continuum begins with awareness and extends to targeted training. Career Pathways programmes typically focus on “exploration” and “preparation” which tend to not lead directly into employment within a specific occupation (as is typical of programmes of Vocational Education and Training). Commonly following successful completion of secondary education, to which Career Pathway provision typically contributes, students are in a position to pursue post-secondary education, vocational education and training, or an entry level job.

Figure 1. Work-based learning continuum (adapted from Linked Learning framework)

Learning about work		**Learning through work**	**Learning for work**
Awareness	**Exploration**	**Preparation**	**Participation**
Activities introduce participants to the world of work and a variety of careers. Short-term interactions between groups of students and people in work are designed to enhance initial career development and provide a foundation for later work-based activities.	Activities are characterized by short-term interactions between people in work and a single participant, or small group of students.	Students apply their learning through practical work (or work-like) experiences. Activities are characterized by longer-term, direct interaction between participants and employers. Students build skills that are relevant for a variety of careers.	Activities involve sustained interactions with an employer in order to master occupational-specific skills.
Examples: Career fairs and career speakers.	**Examples:** Mock interviews, job shadowing, and informational interviews (career conversations with people in work).	**Examples:** Curriculum-connected internships/work placements, and school-based enterprises.	**Examples:** Apprenticeships and internships linked to school-based Vocational Education and Training (VET).



Source: Adapted from (Linked Learning Alliance, 2012[6]) and (ConnectED, 2021[4]).

2. Secondary education systems in five countries

This paper explores in detail innovation in five countries over the last decade: Australia, Canada (British Columbia and New Brunswick), New Zealand, Scotland (United Kingdom) and the United States (Delaware and Texas). In all five countries, youth unemployment grew following the Great Financial Crisis. Between 2007 and 2011, youth unemployment rate[1] rose in Australia from 9.5% to 12%, in Canada from 12% to 16%, in New Zealand from 10% to 17%, in the United Kingdom from 16% to 24%, and in the United States from 11.5% to 19%. Moreover, all five have historically offered limited vocational provision within initial upper secondary education linked to direct entry into skilled employment.

OECD analysis of national systems for initial education and training within upper secondary education places countries along a continuum between general and vocational education. As Table 4, drawn from Spotlight on VET (OECD, 2023[7]) illustrates, the location of a country along the continuum depends upon the proportion of students who are enrolled in programmes of vocational education and training (VET) at upper secondary level. Within this definition, participation on Career Pathway programmes, which are designed more around career exploration than skill development and which are integrated into general secondary schooling would not be classified as forms of vocational education and training. In Australia, Canada, New Zealand and the United States, the proportion of VET students is small (fewer than 25%). In the United Kingdom, it is seen as medium (between 25% and 49%).

[1] The youth unemployment rate is the number of unemployed 15–24-year-olds expressed as a percentage of the youth labour force. Unemployed people are those who report that they are without work, are available for work and have taken active steps to find work in the last four weeks. Source: OECD Labour Market Statistics - https://data.oecd.org/unemp/youth-unemployment-rate.htm.

Table 4. VET provision in initial upper secondary education (2021)

	The size of the VET system at upper secondary level		
Approach to VET at upper secondary level	**Small** (Less than 25%)	**Medium** (25–49%)	**Large** (50% or more)
No (or limited) differentiated VET offered[1]	**Australia**, **Canada**[2], Ireland, **New Zealand**, **United States**	**United Kingdom**	
Differentiated VET track(s) offered	Korea, Lithuania, Brazil, Denmark, Iceland, Japan, Spain	Bulgaria, Chile, Colombia, Costa Rica, Estonia, Finland, France, Germany, Greece, Israel, Latvia, Mexico, Norway, Portugal, Sweden, Türkiye	Austria, Belgium, Croatia, Czechia, Hungary, Italy, Luxembourg, Netherlands, Poland, Romania, Slovak Republic, Slovenia, Switzerland

Note: Table X only includes programmes leading to full completion of upper secondary education (ISCED 3). The size of the VET system at upper secondary level is measured here by the percentage of upper secondary students aged 15-19 who pursue a vocational programme.
1. No (or limited) differentiated VET: VET typically not offered as separate programme at upper secondary level (e.g., Canada, USA) or mostly offered to students who have completed initial upper secondary schooling (e.g., New Zealand, UK).
2. In Canada, VET is offered in the province of Quebec.
Source: (OECD, 2023[7]).

2.1. Variation in national and local responsibility for Career Pathways

The responsibility and power to set and execute policy on government or public schools varies widely across the five countries. How policy decisions are made at the national or subnational level and the influence of private sector funding all have a direct bearing on how these approaches can be scaled and replicated.

2.1.1. Subnational decision-making

On one end of the continuum, in Canada, the federal government has no influence on public education; all education decisions are made at the provincial level and below (Canadian School Boards Association[8]; Council of Ministers of Education, Canada[9]). For example, in British Columbia, the Ministry of Education sets policy and shares governance and funding across its 60 school districts, and approximately 1 600 public schools. They also fund 47 Francophone schools and partially fund (35-50%) private or independent schools.

2.1.2. National decision-making

On the other end of the continuum, while there is shared decision-making from the national to local levels, the Scottish and New Zealand national governments play a significant role in funding and informing public policy. Both countries provide the funding for their public schools from national government and have a national curriculum. In Scotland, the national government provides the funding for education and distributes it in block grants to the 32 local education authorities with elected boards, which in turn determine the distribution and oversight of the funds going to the country's approximately, 5 000 public schools (Audit Scotland, 2014[10]). In New Zealand, while philanthropic partners and employers are beginning to expand their support, the vast majority of funding comes from the national government as well and it is distributed to the 2 500 public schools across 10 regions and

several networks of schools. Each school has its own elected school board to determine strategy (Citizens Advice Bureau (NZ)[11]; New Zealand Ministry of Education, n.d.[12]).

2.1.3. Blended national and subnational decision-making

In Australia and the US, national and subnational funding and decision-making are combined. In Australia, a large majority of funding for upper secondary schools comes from the state/territory governments compared to the federal government (OECD, 2023[13]). Similarly in the US, most funding for schools comes from state and local sources with a smaller amount from federal sources (National Center for Education Statistics, 2024[14]) (there are more than 20 000 local school boards operating at the county level) (USAFacts[15]; U.S. Department of Education[16]). With most funding coming from state or local jurisdictions, most of the decisions on curriculum and staffing are either state or local decisions.

2.1.4. The role of philanthropic giving

The impact of private, philanthropic funds varies considerably across these five countries. Private philanthropic investment in public or state schools is limited in most countries under discussion (Hogan and Williamson, 2022[17]). In the US, however, there are more than 119 000 private grant-making institutions collectively giving out close to $34 billion USD a year towards educational initiatives (Candid[18]; [19]). The funding and governance distinctions across these five countries inform the level of coherence or fragmentation that exist in their jurisdictions.

2.2. Size and composition of population and school systems across jurisdictions

The jurisdictions within which each of the eight case studies in this study lives vary in size and composition of the population and secondary school system (see Table 5).

Table 5. Demographics of total and secondary school aged population across jurisdictions

				PISA 2022	
	Total population (2022, millions)	Population 15–19-year-olds (2022)	% population aged 15–19 years old	% of 15-year-old students from bottom-quartile ESCS	% of foreign born 15-year-old students
Australia	26.0	1,533,000	5.9	25.5	16.0
Victoria	6.6	381,000	5.8	21.6	17.5
Canada	38.9	2,146,000	5.5	23.2	17.5
British Columbia	5.3	282,000	5.3	21.5	21.9
New Brunswick	0.8	41,000	5.1	29.4	10.4
United Kingdom	67.6	3,876,000	5.7	22.2	11.0
Scotland	5.5	283,600	5.2	30.6	9.1
New Zealand	5.1	317,000	6.2	25.0	19.2
United States of America*	332.0	21,565,000	6.5	24.6	6.0
Delaware*	1.0	63,000	6.3	m	m
Texas*	29.6	2,120,000	7.2	m	m

Note: *Reference year 2021. m. data not available: there was no observation in the sample; data were not collected by the country or economy; or data were collected but subsequently removed from the publication for technical reasons. ESCS is the PISA index of economic, social, and cultural status.
Source: Population data, OECD Regions and Cities databases http://oe.cd/geostats & PISA 2022 database.

3. Career Pathways: An historical perspective

The primary focus of this paper is on innovation in Career Pathways undertaken over the last decade. Such programmes however have a much longer history in some countries and understanding of the perceived strengths and weaknesses of such historic provision offers an important context for making sense of most recent design approaches within the eight recently developed programmes considered within this study.

The historical context in each of these countries varies when it comes to the introduction of these blended academic and vocational models of secondary education. Note that since this is a model that involves career exploration and work-based learning, but is distinct from VET as described above, this historical context is confined to the emergence of this newer, hybrid, approach. Of these five countries, the United States has the longest history of working to build "Career Pathways" and therefore, what follows in Section 3.1 is a more in-depth look at that history. Several of the other countries in this study, namely, Australia, Canada and the UK, have been working to move in this direction as well, but their respective experiences are more limited and are therefore, addressed together in Section 3.2. Scotland and New Zealand, two of the countries from which three of the model approaches were studied (Section 6), are not included in this section on historical perspective because this is a burgeoning effort, only taking shape in the last two decades.

From the end of the previous century, policy efforts have been made to soften the bifurcation between academic and vocational education, with several programmes still provided today or serving as precursors to recent innovation in Career Pathways provision. Earlier reform efforts have encountered common challenges in implementation, including lack of programme availability, limited or fragmented provision, barriers in employer engagement, and problems attracting comprehensive student interest.

3.1. United States

Models of Career Pathway programmes in secondary education have been present in different forms in the United States for more than a century. They vary in focus and intensity but share common characteristics: a focus on an area of economic activity or technical skill delivered alongside academic provision; extensive use of work-related and work-based learning; and applied learning styles. Such provision, collectively known as Career and Technical Education (CTE), has benefited from substantial policy attention over recent years (Schwartz and Hoffman, 2015[20]). CTE is a form of educational provision that is predominantly funded by state governments with significant contributions from the federal government. First codified in federal law in 1917, national governments have regularly updated legislation related to the design and resourcing of CTE, notably through Vocational Education Acts (1963, 1968), the Carl D. Perkins Vocational and Applied Technology Education Act of 1984 and its reauthorizations in 1990, 1998, and 2006 (known as Perkins II, Perkins III, and Perkins IV), the School-to-Work Opportunities Act (1994), and the Strengthening Career and Technical Education for the 21st Century Act of 2018 known as Perkins V (Gordon, 2020[21]). In 2021, the federal government provided $1.3 billion to support CTE programmes with some 11 million students participating in such programmes in 2019–2020 (GAO, 2022[1]).

Career and Technical Education is an overarching term that encompasses a range of initiatives designed to better align educational provision with the needs of the labour market. Some form of CTE instruction is widely available to upper secondary students, and

significant portions of students participate. CTE provision includes a range of work-related and work-based activities, but also short, sequenced programmes of study. In 2016–2017, 98% of US school districts offered CTE programmes to students at the upper secondary level, and 83% of those districts offered such programmes within comprehensive general high schools (NCES, 2018).[2]

3.1.1. CTE Programmes of Study[3]

While about five percent of U.S. secondary schools are vocational in focus,[4] the most common form of exposure to CTE in U.S. secondary education is through CTE programmes delivered in comprehensive high schools. CTE programmes focus on broad vocational areas, such as Information Technology, Hospitality and Tourism, Health Science, and Architecture and Construction, which students undertake alongside their academic subjects. In all, 16 CTE clusters are available within which 79 programmes of study are delivered (Advance CTE[22]). CTE courses vary in length between six and 24 weeks per academic year and are typically delivered over two to three hours per week. Students who follow linked programmes in the same CTE subject area over consecutive years and satisfactorily complete two or more CTE courses in the same field of study are known as 'concentrators'. CTE courses are available in most American high schools and are often taught by individuals with some industry experience related to the subject of study (U.S. Department of Education, 2014[23]).

Though public high school students have long had the option to choose one or a sequence of courses designed to enhance understanding of and preparation for post-secondary education and careers, CTE 'programmes of study' were formalized in Perkins IV (2006), which established that all grant recipients (public school districts and charter schools) were to offer one or more programmes of study consisting of "a sequenced, non-duplicative progression of CTE courses that are designed to connect secondary and postsecondary curricula and to lead to an industry-recognised credential or certificate at the postsecondary level or an associate's or bachelor's degree." (U.S. Department of Education, 2014[23]). In this way, it was expected that CTE students would leave secondary education well placed to progress towards career fields of interest. School districts and individual schools are not required to offer the full range of CTE courses and tend to select those courses which relate most closely to local patterns of labour market demand, student interest, and teacher availability. For a description of CTE provision in one state (Virginia), see (Jeon et al., 2023[24]). During 2021–2022, 8.2 million public upper secondary school students (53% of the total 15.4 million students) completed at least one CTE course, and 2.8 million (18%) had completed at least two courses in a specific CTE field ('CTE concentrators') (U.S. Department of Education[25]; [26]).

CTE programmes of study offer students the opportunity to gain some insight into a range of vocational areas whilst still in secondary education. Students often choose to participate in courses linked to multiple areas. However, opportunity for career preparation is limited

[2] CTE programmes defined broadly in the survey that produced this data as "a sequence of courses at the high school level that provides students with the academic and technical knowledge and skills needed to prepare for further education and careers in current or emerging professions" (NCES 2018).

[3] "Programmes of Study" are formally defined under the *Perkins V* federal legislation, while "Career Pathways" are defined under the federal Workforce Innovation and Opportunity Act, or WIOA.

[4] Of the 23 549 public secondary schools in the US in 2020, 1 210 were designated as vocational (NCES 2021). Such vocational schools are not discussed within this paper.

by the number of CTE learning hours and variation in the extent to which provision actively engages students in work-based and work-related learning designed in collaboration with employers (Advance CTE[27]; ERIC Institute of Education Sciences, 2013[28]). As discussed below in Section 4, evaluations of the impact of student participation in CTE programmes have identified positive outcomes for students within both education and later employment, most notably in regard to the experiences of 'concentrators' rather than simple engagement in short, more introductory courses; see for example, (Dougherty, 2016[29]; Kreisman and Stange, 2020[30]). Several efforts have been tried to deepen the student experience and therefore the impact. Programmes such as Career Academies, Tech Prep, and Co-ops build on the CTE foundation and aim to enrich curricula by broadening and deepening provision with consistently strong linkages between education and work, academic and technical content, and secondary and postsecondary education.

3.1.2. Career Academies

Career Academies are career-focused learning communities within US high schools, offering a combination of academic and technical education aligned with specific industry themes that aim to better prepare students for both higher education and the workforce. Developed over 50 years ago, Career Academies expanded quickly in the 1990s with support from the federal government (Kemple and Rock, 1996[31]; Kemple and Snipes, 2000[32]; Stern, Dayton and Raby, 2010[33]). Prominent networks of career academies include Ford Next Generation Learning Career Academies, launched in 2000 (Education Development Center[34]) and the Linked Learning Alliance, first piloted in 2009 (2022[35]; Schwartz and Hoffman, 2015[20]).

Operating as schools within schools and often targeting socially disadvantaged students, Career Academies build on CTE programme provision and are organized around such themes as health sciences, law, business and finance, and engineering (Kemple, 2008[36]; MDRC, 2015[37]; Schwartz and Hoffman, 2015[20]). Academy students take classes together and follow a college preparatory curriculum that includes academic and career-oriented courses and, sometimes, work-based learning activities (Visher, Altuna and Safran, 2013[38]). Typically, students engage in their Career Academy for part of the week or part of every school day. During the remainder of their school week, they participate in general academic studies alongside their peers. As with CTE provision, Career Academy students gain credit towards their high school diploma. Career Academies offer a deeper model of career investigation and preparation to high school students. Each Career Academy typically focuses on one or a small number of the same 16 clustered vocational areas that are endorsed at the federal level for CTE programmes. As with teenage engagement in CTE programmes, Career Academy participation has been associated with improved long-term employment outcomes for students (Section 4).

By 2013, there were at least 7 000 Career Academies in the United States serving one million students across a range of broad vocational fields (NASDCTEc, 2013[39]). However, since then the pace of expansion has slowed with an estimated 8 000 Academies currently in operation (Fletcher Jr., 2023[40]). A series of studies have reviewed provision, identifying a number of limitations including: access, given that academies are typically available only to a fraction of students in a high school; student participation across the range of achievement levels and social backgrounds; and parental/student reluctance to engage in substantial, multi-year provision linked to a specific vocational field (Dixon et al., 2011[41]; Fletcher and Cox, 2012[42]; Kantrove, 2017[43]).

3.1.3. Tech-Prep

Tech-Prep programmes originated in the 1980s with the aim of helping students in the middle range of school performance prepare better for their future careers by linking high school studies to advanced technical education in postsecondary institutions. They were formalized through federal Perkins II funding (1990), which supported partnerships between secondary and postsecondary institutions to provide a sequence of study in a technical field combining at least two years of secondary education (ages 16–17 or earlier) and two years of post-secondary instruction (through age 20–21). Programmes receiving this funding were expected to lead to an associate or bachelor's degree or a postsecondary work-related certificate in a career field as well as placement in appropriate employment or continuing education (U.S. Department of Education, 2017[44]; 2014[23]). Within the United States, the model pioneered the use of articulation agreements, institutional linkages, sequencing, and dual credit (where high school students take postsecondary classes for credit towards completion of tertiary programmes) to better link secondary education to post-secondary paths (Jobs for the Future, 2015[45]).

According to a 1998 national evaluation, most secondary-tertiary partnerships receiving Tech-Prep funding had implemented individual elements of the Tech-Prep model rather than the intended combination of elements (Hershey et al., 1998[46]). Moreover, while the federal programme was intended to serve the broad middle segment of American students who would likely finish high school but not earn four-year college degrees, it was estimated that the majority of the 8% of high school students who participated in Tech-Prep in 1995 were drawn from student groups already expected to continue to four-year degrees. Limited funding was cited as a challenge to full implementation. While federal support for Tech Prep was phased out in favour of CTE Programs of Study starting in 2006 (U.S. Department of Education, 2014[23]), this model—along with the "Early College High School" model, which enabled high school students to complete up to two years of tertiary education, often on a college campus (Atchison et al., 2019[47])—helped lay the foundation for P-TECH, or Pathways in Tech Early College High Schools, which emerged in 2011 and involved building three-way partnerships among secondary schools, postsecondary educational institutions, and employers (more in Section 0).

3.1.4. Co-operative education

Co-operative (or 'co-op') education is a long-standing method of instruction dating back to the turn of the 20th century (Barbeau, 1973[48]; CEIA[49]; Commonwealth of Pennsylvania Dept. of Education, 2021[50]) in which students combine classroom-based education with (typically paid) practical work experience. Though co-ops in the United States are most common in tertiary education, many school districts provide co-op programmes for upper secondary students aged 16–18. As opposed to internships within general education, co-op programmes, which are often called "work-study", are structured and integrated into a student's academic curriculum, and are typically longer, lasting one semester or a full year. The student, school, and employer jointly develop an individualized plan that includes technical and employability skills training in the student's area of interest, often linked to a CTE programme of study. Students are assessed and receive academic credit for their participation. Because of the time commitment required—students typically work at least 10 hours per week—co-ops are often offered to students in their last year of secondary school (17–18-year-olds) alongside a moderate remaining academic workload. For example, Chicago Public Schools requires that participants be in the final year of upper secondary education, "on-track to graduate by taking only four in-school classes in senior year", and able to work "a minimum of 180 hours/semester which equates to approximately 10 hours/week".

Co-operative education is geared toward specific types of students, such as those deemed at risk of not completing high school or who plan to enter the labour workforce upon graduation (Theodos et al., 2017[51]). In Chicago, the two main organizations that help place co-op students with employers serve a total of a few hundred students annually, compared with the city's approximately 25 000 total public school students in the last year of secondary. Over 90% of participants were youth of colour, and well over half lived in low income households (Urban Alliance, 2020-2021[52]).

3.2. Canada, Australia, and the United Kingdom

Canada, Australia, and the UK also have histories of Career Pathway provision, providing a resource bank of research materials linked to their design, delivery and outcomes.

3.2.1. Canada

In Canada, forms of co-operative education and 'high school apprenticeships' within general secondary schooling have a long history. In a highly devolved system, where education policy is determined at the provincial level, such provision varies in characteristics, but shares similar approaches to teaching and learning. In New Brunswick for example, students in the final two years of upper secondary education have long had the option of enrolling in courses that reflect a vocational focus alongside their more traditional academic studies (TIBERT[53]). These programmes (of up to 360 hours in duration) involve a work placement lasting from several weeks to a full semester designed to give students the opportunity to begin training and certification in an industry of interest within a learning environment that encourages reflective practice (OECD[54]).

Co-operative education has been common in Canadian schools since the 1980s. Co-op programmes are comparable to similarly-named provision in the United States but have proved more popular among students, with around one in ten of final year Canadian students typically enrolling (OECD[54]), compared with only small fractions in United States. Historically, co-op programmes in Canada engage students from a wide range of academic profiles, including those planning on going onto university education (Fairbairn, 1999[55]). Co-op work placements in Canada are typically unpaid. In contrast to the US, co-op programmes in Canada tend to more consistently overlap with programmes known as "pre-apprenticeships" (in New Brunswick) or "youth apprenticeships" (in Ontario) which allow students to work toward their high school diploma and apprenticeship certification at the same time, typically through paid work-based training provision (FutureNB, 2024[56]; Hamilton-Wentworth Public Schools[57]). The Registered Apprenticeship Program (RAP) in Alberta allows students 16 years or older to earn credits toward their high school diploma while beginning training in an 'apprenticeable' occupation. The Ontario Youth Apprenticeship Program is similar except that students are not required to register as apprentices with the provincial Apprenticeship Board when they enter the programme. In both provinces, high school coordinators help students find employers willing to provide on-the-job apprenticeship training, monitor youth in the worksite, and ensure that participants complete both high school and apprenticeship training requirements. Students usually complete the on-the-job hours required for the first year of their apprenticeship by the time they finish high school. (Taylor, Raykov and Hamm, 2014[58]). In New Brunswick, pre-apprenticeships are defined as any activity that allows students to gain apprenticeable hours toward a skilled trade career after graduation. One option is the province's Teen Apprentice Program (NBTAP), a three-year programme for students starting at age 15 that includes two or three paid summer work terms (Canadian Apprenticeship Forum - Forum Canadien Sur L'Apprentissage[59]; Future NB[60]). In British Columbia, the Youth Work in Trades

programme is offered to students 14 years of age or older in grades 10-12 and allows students to earn four courses' worth of secondary school graduation credits and at least 900 hours towards trade certification (Government of British Columbia[61]). The majority of these programmes were launched or formalized in the 1990s (Government of Alberta, 2008[62]; Government of Ontario, 2001[63]; Hargreaves, 2011[64]).

While co-op programmes and pre-apprenticeships remain important options for many students in Canada, concerns are apparent over potential long-term limitations of the educational model. With the great majority of new jobs over the decade to 2035 expected to require post-secondary degrees, existing programmes may be perceived as insufficient in preparing for education beyond high school, such as by enabling accumulation of dual credit. Concern too has related to the weak links between work-based learning and academic curricula required for high school graduation (Government of British Columbia, 2023[65]; [66]). Such factors have helped shape the design of new Career Pathways approaches in the two provinces explored in depth below (Section 6).

3.2.2. Australia

In Australia since the 1990s many general high schools have offered students programmes of vocational training undertaken alongside programmes of general education. As of 2022, a quarter of a million students participated in 'VET in Schools' (or 'VDSS, VET Delivered to School Students') provision. Predominantly, students undertake learning outside of their school, with private or public providers of vocational education. Provision is underpinned by federal government funding (OECD, 2022[67]). Enrolled students can expect to gain certification linked to vocational programmes, but also integrate relevant credit into their overall completion of their Senior Secondary Certificate, a general high school diploma marking the completion of secondary education. School-based Apprenticeships and Traineeships (SBAT) were introduced in the 1990s as a particularly intense form of work-based learning available to students from the age of 15. Students enter into a contract endorsed by their school, a training provider, and an employer and typically undertake two days a week of paid employment and training. Students are expected to complete their Senior Secondary Certificate (to which the SBAT contributes) and consider all progression options at the end of secondary education. SBATs articulate with post-secondary apprenticeship provision with successful students completing the first stages of a Certificate III qualification while still in school. Over 160 SBATs are available in fields such as financial services, information technology, plumbing, mechanical engineering and horticulture (New South Wales Government[68]). While successful in enriching educational choices open to Australian youth and supporting employment outcomes, uptake has been falling in some states over recent years, in part due to quality considerations and concerns over the effectiveness of VET in Schools in challenging patterns of social and gender bias (Gonski and Shergold, 2021[69]; Klatt, Clarkea and Dulfer, 2017[70]) and because progression onto tertiary study has been limited (Cercelli and Siekmann, 2022[71]). As described in Section 6, a primary aim of the Head Start programme in Victoria has been to improve the quality and increase the uptake of SBATs.

3.2.3. United Kingdom

The UK also has a history of Career Pathways, if more limited and driven particularly by curriculum innovation in England and Wales. One substantive effort to rethink career preparation in the UK took place in England and Wales in the early 2000's. Following a series of pilot programme initiatives delivered within general secondary education (notably, Young Apprenticeships, the Key Stage 4 Engagement Programme, and Increased Flexibility Programme at Key Stage 4), the publication of the Tomlinson Report (2004) led to the introduction in England and Wales of new qualifications at lower and upper secondary level related to broad economic areas, enriched by work-related and work-based learning (Hodgson and Spours, 2007[72]; Isaacs, 2013[73]). Introduced as 14-19 Diplomas, students were offered the chance to engage in 17 possible fields of study, including Engineering, Travel and Tourism and Creative and Media. The Diploma qualifications were designed by working groups, including employer representatives, and delivered in component areas: a principal field of study linked to the vocational area; functional skills (Mathematics, English and ICT applied to the field of study); a project; and a minimum of 10 days related work experience. Students would expect to study their Diploma over one day a week alongside their other academic subjects. Prior to discontinuation after a change of government in 2010, these new approaches to learning left a legacy of extensive evaluation. While reviews found evidence of higher levels of student motivation and engagement, structural design issues were seen to hinder student success. Delivered by consortia of schools, training providers, employers, and universities, logistical challenges were identified notably relating to timetabling, transportation between learning sites, and the delivery of functional skills in an applied manner (Jones, 2021[74]; Ofsted, 2009[75]).

4. Evidence of impact

A large number of evaluations have been conducted of such long-standing forms of Career Pathways. Career Pathways are commonly designed with a focus on enhancing the employment outcomes of young people, and available analysis of the long-term impacts of related programmes suggests strongly that they do just that. Annex A of this paper summarises available empirical studies that have looked for evidence of better adult employment outcomes linked notably to teenage participation in historic (typically pre-2010) provision of CTE, Career Academies and Co-operative Education. In all, 23 studies have been identified which use randomised controlled trials or longitudinal cohort analysis to assess whether students can expect better employment outcomes (defined as lower rates of Not being in Education, Employment or Training (NEET) and/or higher wages and/or greater job satisfaction) than comparable peers. Of these, 20 provide evidence of improved employment outcomes in some form after accounting for gender, social background, academic achievement and other factors which could be expected to influence success in the labour market. While randomised control trials, such as (Kemple, 2008[36]) account for student motivation by randomly assigning potential participants into intervention and control groups, longitudinal studies apply control variables to account for variations in outcomes between young people who engaged or who did not engage in specific programmes of study explained by wider characteristics such as gender, social background, educational achievement, ethnicity and migrant status which are widely understood to shape economic outcomes.

4.1. Empirical evidence related to Career Pathway design

The review of empirical literature summarised in Annex A, builds upon Covacevich et al. (2021[3]) which explored longitudinal datasets relevant to student participation in career development provision, including Career Pathways. The analysis reviewed datasets in ten countries and tested for statistically significant links between teenage career development, typically undertaken at age 15, and employment outcomes (unemployment rates, earnings and job satisfaction), typically at age 25. This OECD analysis moreover explored other more specific forms of career development (such as engagement with employers in job fairs or career talks and participation in internships) which frequently are undertaken by students within Career Pathways. Within the current study, longitudinal assessments were identified in Australia (1), Canada (1) and the United States (21).

This overview of the long-term employment impacts associated with participation in Career Pathway programmes provides a compelling, if limited, insight into the value of such programmes in providing students with a measurable employment boost within the early labour market (Dougherty, 2023[76]). The size of the impacts observed are often substantial and long lasting. The analysis of Canadian data by Covacevich et al. (2021[3]) for example of adult outcomes associated with teenage participation in high school 'courses with employer engagement' found that participants in such programmes were 6 percentage points more likely to be in employment, education or training at age 25 than comparable peers who had not done so. At age 30, drawing on tax records, these teenage participants were found to be earning 3% more annually than comparable peers. Kemple's study of US participants in Career Academy programmes reviews earnings data eight years after high school completion and finds that young adults who had enrolled (by randomised assignment) on the programmes in high school earned an average of 11% more annually than comparable peers (Kemple and Rock, 1996[31]). Using the same dataset, Page (2012[77])

calculates the wage premium of young adults who had completed (rather than just enrolled) in a Career Academy in high school to be more than $500 a month.

There is also evidence to suggest that young people facing greater levels of disadvantage can expect to gain particularly from participation in Career Pathway programmes. The US students assessed by Kemple (2008[36]) are predominantly Black and Hispanic living in lower income neighbourhoods. The study finds that the greatest ultimate wage premiums were enjoyed by young people who as students exhibited the strongest risk of drop-out (Kemple, 2008[36]). Neumark (2005[78]) follows up his longitudinal 2004 study ([79]) which identified positive impacts linked to school-to-career programmes delivered in US schools by dividing his sample into two groups based on likelihood of attending university. He finds that students facing greater progression barriers into tertiary education could expect greater comparative long-term positive employment impacts than peers notably with regard to participation in co-operative education and 'internship/apprenticeship' programmes within high school. For young women from more challenging backgrounds, the study found higher earnings to be ultimately associated with what were described as 'internship/apprenticeship' programmes within high school, but Kemple (2008[36]) finds female wage boosts to be much more modest than those enjoyed by men. Studies also reveal wider benefits for young people facing disadvantage, including students with disabilities (Carruthers et al., 2022[80]; Enayati and Karpur, 2018[81]; Shandra and Hogan, 2008[82]).

Longitudinal research is most strongly available in relation to school-taught programmes of Career and Technical Education. Research demonstrates that high-quality, high-intensity CTE can lead to improved academic and economic outcomes for students, particularly higher rates of student engagement, on-time high school graduation, as well as workforce earnings and enrolment in tertiary education (Ames, 2022[83]; Dougherty, 2018[84]; Ecton and Dougherty, 2022[85]; Gottfried and Plasman, 2017[86]; Kemple, Unterman and Dougherty, 2023[87]; Kreisman and Stange, 2020[30]).

Studies suggest that specific forms of CTE provision within high schools are more strongly associated with better later outcomes. Ecton and Dougherty (2022[85]) for example use a large longitudinal student dataset from Massachusetts and find evidence of significant wage boosts for CTE concentrators: students undertaking sequential courses in the same subject field over a number of years. Around age 23, earnings are found to be notably higher in relation to teenage participation in CTE provision in healthcare, information technology and education. The structure and amount of CTE coursework in which a student engages have also been related to better outcomes: more advanced, sequenced coursework is associated with better results. A longitudinal study that followed three cohorts of more than 100,000 students in Arkansas from eighth grade (age 13-14) to tertiary education and into the workforce found that students who chose to concentrate in CTE (by earning three or more credits in a programme of study) were 21 percentage points more likely to graduate from high school than their peers who did not concentrate; see also, Carruthers et al. (2022[80]). The study found that additional CTE coursework is related to higher levels of community college enrolment, and employment and earnings (Dougherty, 2016[29]). These findings are supported by a study that found that taking advanced CTE courses is associated with a 2 percent wage premium for each additional year of study, while introductory CTE courses were related poorly with wage gains (Kreisman and Stange, 2020[30]). Some of the strongest evidence supporting CTE has been conducted at Career Academies (Hemelt, Lenard and Paeplow, 2019[88]; Kemple, 2008[36]), which offer highly structured, sequenced themed CTE learning.

Longitudinal reviews of historic Career Pathway provision provide consistent evidence that stronger employment outcomes can be associated with different Career Pathway approaches. Evidence suggests that programmes of longer duration, more intensely

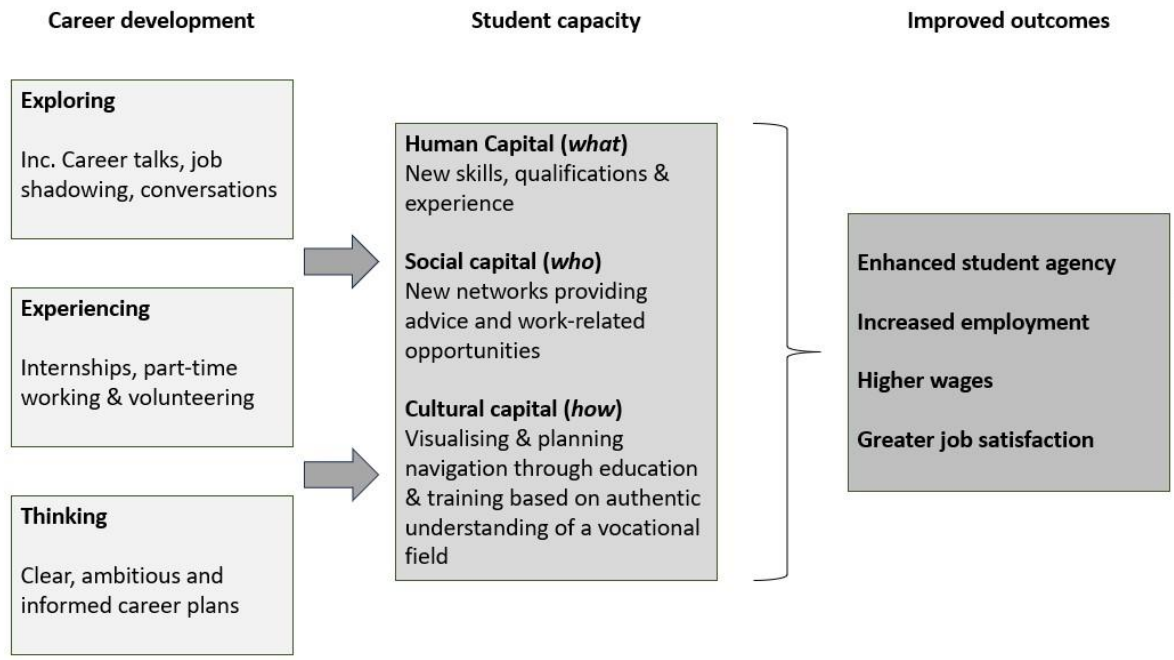
delivered in the final years of secondary education and focused on particular vocational areas can be expected to link most strongly with better employment outcomes for young people. Longitudinal evaluations are heavily concentrated within one country (the United States) and at times constrained by lack of detailed information on the character of the learning programmes in which students engaged. As Career Pathways become more popular, the need for stronger empirical data grows. Within this, it is important to clarify the duration and intensity of learning programmes and to disaggregate the elements of provision in which students engage, for example work-based learning. Here, further OECD analysis helps to explain the positive employment outcomes observed.

4.2. How career development activities improve outcomes

OECD analysis of the long-term impact of Career Pathway programmes was initially undertaken within a Career Readiness study that explored relations between different forms of teenage career development and better employment outcomes (Covacevich et al., 2021[3]). This review of longitudinal datasets in 10 countries found strong evidence that the ways in which students explore, experience and think about potential futures in work around the age of 15 are associated with better employment outcomes (lower NEET rates, higher earnings and/or greater job satisfaction) around the age of 25. As with the academic literature discussed above, analysis includes statistical controls for academic achievement, gender, social background and other factors likely to influence employment success. In terms of career exploration, better outcomes are observed in relation to student participation in career conversations, career talks/job fairs, workplace visits/job shadowing and application and interview skills development activities. Experience relates to work-based activities including part-time employment, volunteering and to a lesser extent internships (Covacevich et al., 2021[3]). Such activities relate strongly to engagement with employers and people in work which are commonly built into the design of Career Pathways programmes. Career thinking relates to student clarity in career expectations, higher occupational ambition, the alignment of career and educational plans and instrumental motivation with regard to schooling supporting career progression (Covacevich et al., 2021[3]).

The positive relationships between teenage career development and better employment outcomes have been understood in relation to theories of human, social and cultural capital (OECD, 2024[89]). As students stay in education longer, they face more decisions about how to accumulate knowledge, qualifications, and experience (human capital) relevant to their future work. Career development helps young people learn about potential futures in work and the value that recruiters place on different forms of human capital. Analysis of PISA 2018 data shows that student participation in career guidance activities is significantly associated with clearer and more ambitious career plans that recognise the value of education (Covacevich et al., 2021[3]). While human capital is strongly linked to economic success, it alone does not fully explain young people's success in securing desirable employment (Brown, Lauder and Cheung, 2020[90]). Social capital, the network of people an individual knows, enhances students' understanding of the labour market and provides practical forms of support, such as access to work placements and recommendations. Social interactions with professionals offer young people trusted advice and guidance in relation to specific vocational fields of interest. Such interactions build students' cultural capital: their confidence navigating into and within a particular professional setting, often described as understanding 'the rules of the game' (OECD, 2024[89]; [91]).

Figure 2. How career development activities at age 15 relate to improved wage and life outcomes at 25



Source: adapted from https://www.oecd-ilibrary.org/education/career-guidance-social-inequality-and-social-mobility_e98d0ae7-en

5. Expansion and innovation in Career Pathways

In response to concern over poor transitions into the labour market and growing acknowledgement of evidence concerning the effectiveness of Career Pathways in enhancing employment outcomes for young people, the last decade has seen considerable innovation in the development and delivery of such programmes. New approaches seek to address concerns raised over the historic provision of Pathways; notably, lack of programme availability, inequitable and fragmented provision, challenges in employer engagement, logistical difficulties in delivery, and problems in attracting comprehensive student interest. In reviewing new provision, insights emerge into the broader motivations of policy makers.

5.1. New and persisting policy motivations

The remainder of this paper focuses on innovation in Career Pathway programmes in five countries: Australia, Canada, New Zealand, Scotland, and United States. The drivers for innovation in this work vary among contemporary policy makers (OECD, 2011[92]; 2010[93]; [94]; Schwartz, 2016[95]; Symonds, Schwartz and Ferguson, 2011[96]). However, an analysis of policy documents linked to innovation in Career Pathways identifies three broad motivations across the five countries of focus:

- Improve the schooling experience itself;
- Better prepare students for post-secondary life; and
- Address the needs of the economy and society.

Table 6 summarizes the relative weight placed on each broad concern and specific related motivations based on a review of 24 Career Pathway-related documents from five countries that either stated government policy (frameworks, strategies, rationales, plans) or are government-commissioned independent reviews that were subsequently endorsed or adopted by policymakers. Most documents were identified by the practitioners and policymakers interviewed for this study as highly influential either to Career Pathways innovation in general or to the specific programmes highlighted in this paper. The remainder were identified by the study team based on relevant legislation and the websites of the ministries and government agencies responsible for setting Career Pathways-related policy. As the table shows, countries vary in some of the motivations behind Career Pathway innovation, though all appeared strongly driven by concerns about students' readiness for post-secondary careers and the talent and skills needs of their evolving economies.

Table 6. Relative importance of different policy motivations influencing Career Pathways innovation across five countries, 2011–2024

Motivation/ Objective	USA	CAN	SCOT	AUS	NZ
Improve the schooling experience	**++**	**++**	**+**	**++**	**+**
Engaging and relevant schooling experience	+		+	++	+
Quality schooling enjoyed equitably	+	++	+	++	+
Better prepare students for post-secondary life	**+++**	**+++**	**+++**	**+++**	**+++**
Students making informed choices for post-secondary life		+	+	+++	++
Students prepared for evolving economy/technology/world	+++	+++	+++	+++	++
Post-secondary opportunities available equitably	++	+	+	++	+
Address the needs of the economy and society	**+++**	**++**	**+++**	**++**	**+++**
Current and expected talent/skills needs met	+++	++	+++	++	+++
Low rates of youth unemployment and NEET*	+		+	++	+

Note: *NEET = Not in education, employment, or training. Strength indicators (none, minor +, medium ++, strong +++) for the three broad motivations are determined by comparing the number of key policy documents in the jurisdiction that cite each area of concern with the total number of influential policy documents reviewed for that jurisdiction. See Annex B for further details, underlying frequencies, and sources.

5.1.1. Improving the schooling experience

A common theme in policy documents is the view that traditional approaches to learning within general education with little differentiation based on students interests and little to no connection with post-secondary employment have not been working for many students. As a major review of vocational and applied learning in upper secondary schooling in Victoria, Australia put it: "Students have different interests, strengths, qualities and aspirations; the range of pathways in upper secondary should reflect this diversity" (Firth, 2020[97]).

In particular, policy makers expressed concern that existing educational provision had worked least for learners from socially disadvantaged communities. Across multiple jurisdictions, policies and reviews cited unequal learning and attainment outcomes across location, ethnicity, family income, or disability status as a motivation for policy reform (Government of British Columbia, 2018[98]; Loyd, 2022[99]; New Brunswick Dept. of Education and Early Childhood Development, 2021[100]; New Zealand Ministry of Education, 2018[101]; Shergold, 2020[102]). A related concern within policy documents focuses on the need to improve student engagement in education. In Scotland for example, the 2014 Wood review, which led to the creation of Foundation Apprenticeships, saw a strong connection between high levels of youth unemployment and student scepticism over the relevance of education to their long-term economic well-being (Wood, 2014[103]). In light of growing absenteeism since the COVID-19 pandemic, policy makers have seen Career Pathways as a means of enhancing and demonstrating the extrinsic value of education to young people and their families (Chang, Balfanz and Byrnes, 2023[104]; New Zealand Ministry of Education, 2023[105]). Luke Rhine, Deputy Assistant Secretary of Education in the US Department of Education and former Associate Secretary for Career and Technical Education in the Delaware Department of Education and primary architect of Career Pathway programme development in that state, notes for example:

> *In the traditional education model…if we do not focus time on things that actually help a person transition beyond high school, it is, in my opinion, a waste of time. I've always been surprised that it doesn't actually take a lot to ignite a spark. It just takes the right things. For one person that can just be a nudge from a caring adult that says, 'Hey, you're good at this. You should consider this as a career.' And for another student, it's actually experiencing that career as an affirming decision to then move within that trajectory. And I think we don't do a good job of building those experiences at scale for young people across our country. And we are watching young people transition beyond high school without a sense of self, without a plan. (Interview, August 2023)*

Within such concerns, questions of equity loom large with policy documents highlighting concerns that more marginalised students—notably, low income, ethnic minority and students with disabilities—face greater risks of disengagement from education (Loyd, 2022[99]; New Brunswick Dept. of Education and Early Childhood Development, 2022[106]; New Zealand Tertiary Education Commission, 2022[107]). In Australia, Canada and New Zealand, related policy initiatives have focused on the additional needs of Indigenous students through curriculum reform (Australian Government, 2023[108]; Government of British Columbia, 2023[109]) and of girls seeking to enter vocational areas where their gender is historically underrepresented, such as in the skilled trades (for example, New South Wales's Girls Can Too programme, Box 2).

5.1.2. Better preparing students for post-secondary life

One motivation for policymakers in Scotland and the US was the long-term impact on youth employment of the Great Financial Crisis (2007-09) which drove interest in new approaches to enhancing the employability of young people. Recognising the success of countries with strong vocational systems, notably Germany and Switzerland, in maintaining low levels of youth unemployment in spite of the Crisis, opportunities were identified to increase career development within education systems where the great majority of students stay in general education until the end of upper secondary (OECD, 2010[94]). A prominent theme within the policy literature relates to the ways in which the world of work is changing and the need for education systems to respond to new patterns of skill demand within the labour market (Government of British Columbia[110]; Skills Development Scotland, 2022[111]). Angie Calleberg, Executive Director for Student Learning for British Columbia (BC), explained why their province started in 2011 working with community stakeholders to redefine the definition of an educated citizen K-12 (Government of British Columbia, 2024[112]):

> *"BC was already listed as a high performing jurisdiction internationally, but while our kids were doing well right now, there was this question about how well we were preparing them for a very unknown future; a future we couldn't quite imagine." (Interview, February 2024)*

Concerns in British Columbia and elsewhere have focussed on the implications of technological change for working life and notably the importance of competencies that extend beyond specific subject knowledge that allow an individual to thrive within an increasingly complex and uncertain employment culture. In the United States for example, a joint publication of the US Departments of Education, Labour, and Commerce argues:

> *"Today, most good jobs—or those that provide a living wage—require some form of career-connected postsecondary education and training. This demand will only continue to grow, with 70% of jobs requiring education or training beyond high school by 2027. As such, the United States needs to dramatically increase the population that possesses a postsecondary credential. We need to connect our education and workforce systems to unlock pathways into the middle class, providing lifelong social and economic mobility." [U.S. Department of Education].*

Within the US, this approach is currently underpinned by federal funding through the Raising the Bar initiative which is designed to help states reimagine how schools are designed to prepare all students to prosper in their future careers. The country's Unlocking Career Success programme encourages and enables states to enhance provision through greater provision of dual enrolment (allowing students in secondary education to attain credit towards tertiary qualifications), work-based learning, workforce credentials, career advising and support – all forms of educational innovation commonly found within Career Pathway programmes (U.S. Dept of Education[113]).

Similarly, in British Columbia it is estimated that approximately 75% of the 'good' jobs by 2033 will require at least some education and training beyond secondary school (Government of British Columbia, 2023[65]). In the "Stronger BC: Future Ready Action Plan", the government of the Canadian province committed some EUR 330 million over three years to address the one million job openings predicted over the next decade (Government of British Columbia, 2023[109]), including investments in emerging industries ranging from clean energy to biopharma. The BC Ministry of Education and Child Care aligns with the plan by investing in efforts to increase educational attainment through dual enrolment and expanding access to educational provision related to high demand economic sectors, such as healthcare and engineering.

By closing the gap between education and employment, policy makers express the hope that students will gain a more comprehensive preparation for working life, including insights into professions at risk of substantial change. In Scotland and New Zealand, this has been articulated as working to increase coherence between employers, work-based learning and schools. In the former, Skills Development Scotland's most recent five-year strategic plan highlights ongoing changes related to technological innovation and climate change and lays out a plan to build a more agile, responsive, resilient and inclusive, skills and careers system in response to the reality that "the world is experiencing a historic transformation in how people work, where they work, and even why they work" (Skills Development Scotland, 2022[111]). In New Zealand, the Ministry of Education is exploring how to implement the 2020 Statement of National Education and Learning Priorities, which cited career readiness as one of the nation's five priorities for improving public education of its learners or 'akonga' (Maori): "Collaboration with industry and employers to ensure learners/akonga have the skills, knowledge and pathways to succeed in work" (New Zealand Ministry of Education, 2021[114]). In Canada, this broader conception of educational success is articulated as a Portrait of a Learner, highlighting attitudes and competencies that students are expected to develop through their K-12 education. In New Brunswick, a strong emphasis is now placed on enabling students to apply their learning to challenges encountered in the real world, underpinning the perceived value of career-connected, experiential learning.

> *Learners need to develop global competencies to meet the shifting and ongoing demands of life, work, and learning; to be active and responsive in their communities; to understand and respect diverse perspectives; and, to act on issues of significance. These skills, sets of knowledge, and attitudes are transportable across disciplines and are required to take action to make life better for oneself and others. Through their experiences, learners develop the confidence and capacity to engage in critical thinking to understand and resolve problems. They also use critical thinking to seek opportunities for growth within themselves and their communities. They turn ideas into action to meet the needs of a community and to develop an entrepreneurial mindset to contribute new-to-the-world or improved solutions to complex economic, social, and environmental issues. They develop leadership traits, models for risk-taking, independent and unconventional thinking, and the ability to create and innovate by experimenting with new strategies, techniques, and perspectives through inquiry research.* (New Brunswick Dept. of Education, 2019[115])

In British Columbia, in order to graduate, all students are required to participate in a minimum of 30 hours of career-life exploration and complete two semester-long courses—Career-Life Connections and Career-Life Education—designed to help young people gain clarity on their post-secondary path (Government of British Colulmbia, 2019[116]; Ministry of Education and Child Care, 2023[117]). Relatedly the core skills of communication, critical thinking, and social emotional learning, known as "meta-skills" in Scotland and "durable skills" in the US, feature prominently in the design of Career Pathway programmes (America Succeeds[118]; Skills Development Scotland[119]).

5.1.3. Addressing the needs of the economy and society

Policy making in the field of Career Pathways has also been shaped by specific projected skills needs. In Scotland, investments in Foundation Apprenticeships, notably with regard to engineering curricula, reflect concern over climate change and the anticipated demand for new and emerging jobs directly related to the transition to net-zero carbon emissions by 2050 (Skills Development Scotland, 2020[120]). In Australia, policymakers point to other implications related to planning for the jobs of the future. The Report of the Review of Senior Secondary Pathways into Work, Further Education and Training chaired by Peter Shergold (2020[102]) has driven enhanced interest in upper secondary programmes, such as Head Start (discussed in Section 6), designed to better prepare young people for a changing economic landscape.

> *"The world young people are entering is changing dramatically and rapidly in terms of the skills and capabilities required for the occupations and challenges of the future. A fourth industrial revolution is underway as we see technological advances blurring the boundaries between the physical, the digital and the biological. Jobs, both trade and professional, are likely to change profoundly. Some will disappear. Others will emerge. Cognitive technology will likely require more people with understanding of robotics, but, paradoxically, also more care workers."* (Shergold, 2020[102])

From a US perspective, Amy Loyd, U.S. Assistant Secretary for the Office of Career, Technical and Adult Education, argued in an interview with the review team that an historic opportunity had emerged to link investments in industrial policy and educational provision.

The past couple of years have [involved] historic, once in a generation, investments …through the Bipartisan Infrastructure law, the Chips Act, the Inflation Reduction Act, there are trillions of dollars going out to transform our nation's economy. This requires us also transforming our educational workforce systems to make sure we're able to live up to this moment…So, [through] 'Unlocking Career Success'…we want every single high school student to graduate high school with four things: ongoing, developmentally appropriate career counselling and navigation; college credit; meaningful work-based learning experiences; and industry credentials…I am in the fortunate position of being able to look across the nation and see the bright spots, but I still see programs and not systems. And we're really trying to move to system[s]." (Interview, August 2023)

Box 2. Building Industry and Education Partnerships in New South Wales, Australia

In 2021, the government of New South Wales (NSW) established the Regional Industry Education Partnerships (RIEP) Program to better connect employers with secondary schools across the state, part of a response to independent reviews of pathways for senior secondary students (Shergold, 2020[102]) and the vocational and training sector (Shergold and Gonski, 2020[121]). The reviews identified the need for a stronger intermediary mechanism for enabling schools to engage with employers to enhance work-related and work-based learning (New South Wales Dept. of Education, 2023[122]). The staff of the RIEP co-design work-based learning activities ranging from career exploration to paid part-time employment based on the needs of schools, students, and employers in a given region. In 2021–2022, the staff of 26 RIEP offices covering different regions statewide, connected 685 schools with 1 438 employers. (New South Wales Dept. of Education, 2023[123]).

One RIEP program, Girls Can Too, was developed to enable female students to explore traditionally male-dominated fields like the trades. Through several day-long tasters and a week-long internship over the course of a semester, participants engage in a range of occupational areas, exploring one field more deeply (New South Wales Dept. of Education, 2022[124]). The study team visited Girls Can Too programmes on a work site and two schools in Wagga Wagga, NSW. One young woman who had grown up on a station (farm) and was struggling in school shared, "*I have had my challenges in school, but when I tried welding, it came natural to me. The other students started looking to me for advice. For the first time, I felt like a leader*." (Student interview, April 2023, school in Wagga Wagga, NSW)

5.2. Innovation in Career Pathways: international approaches

Since the Great Financial Crisis, education systems have introduced models of provision designed to broaden learning opportunities for young people, allowing them to explore potential fields of future employment within new forms of provision. P-TECH (Pathways in Technology Early College High Schools) programmes, for example, were initiated in 2011 and are now available in 28 countries, including all five countries which are the focus of this paper (Dixon and Rosen, 2022[125]). P-TECH began as a collaboration between the technology company IBM, New York City Department of Education and the City University of New York. The programme focuses on subjects related to Science, Technology, Engineering and Mathematics (STEM) and is delivered over four to six years through secondary education and the first two years of post-secondary education. Students participate in a range of workplace experiences, including mentoring, worksite visits and paid internships. Upon successful graduation, they have the academic and professional skills required to either continue their education onto articulated tertiary provision or, depending on the focus of their programme, access entry-level careers in IT, healthcare, advanced manufacturing and other related, similarly competitive fields. P-TECH serves students from primarily socially disadvantaged backgrounds, with no testing or grade requirements for entry into the programme. Students devote up to two days a week to their specialised P-TECH studies. In this way, P-TECH programmes can be seen to go beyond CTE provision in offering a longer, more integrated programme of study, with assured employer and tertiary engagement, designed to enable more seamless ultimate transitions into STEM employment (Petersen and Andersen, 2018[126]). In the United States, hundreds of high schools now offer P-TECH programmes. In Texas, which has 276 P-TECH schools (Texas Education Agency, 2024[127]), in recognition of the higher costs of the P-TECH programme, additional per student funding of USD50 is received by participating schools, which also have access to start-up grants. Within the state, P-TECH schools are described as "free, open-enrolment schools which are aligned to regional workforce needs and students". Through the P-TECH programme, students are expected to:

- receive a high school diploma and an associate degree, a two-year postsecondary certificate, or industry certification;
- complete work-based training through an internship, apprenticeship, or other job training programme, engaging with an employer which formally partners with their school;
- have access to postsecondary educational and training opportunities at an institution of higher education;
- benefit from an agreement with regional industry or business partners that will give first priority in interviewing for relevant jobs to P-TECH students (Texas Education Agency, P-TECH, 2020[128]).

In Hong Kong, CLAP-TECH provides an example of a recent introduction of an adapted P-TECH model focused on information technology within an education system that has historically been strongly focused on general education to the age of 18. At the conclusion of the five-year course of study, successful students receive credit towards their overall graduation from upper secondary education. In survey evaluations with a control group, participants engaged on the CLAP-TECH programme for two years or longer were seen to develop greater confidence in understanding of the IT industry and preparation for post-secondary transitions (Chan et al., 2023[129]).

Also notable has been the adaptation of the global International Baccalaureate (IB) programme to incorporate a Career Pathway dimension. The IB was launched in 1968 as

an upper secondary qualification and is currently offered in 41 countries, including all five of these predominantly Anglophone countries[5]. Since 2012, IB schools have had the opportunity to offer the IB Career Programme (IBCP) to students. As of 2023, the IB Career Pathway was available in 309 schools in 41 countries. Whereas typically IB students (aged 16-18) focus on three primary subjects of study, young people engaging in the Career Programme stream undertake two primary subjects and for their third area focus on specialised career-related studies that align with their individual career aspirations. This may involve vocational courses, work placements, internships, or other practical experiences. While such career-related courses vary from school to school, common areas of focus include hospitability, health science, business, and engineering. Students also complete a personal project that requires them to explore a real-world issue. Students are expected to identify, analyse, and discuss a vocationally-related ethical dilemma within their project. As is the case with students enrolled on the IB Diploma Programme, the IBCP certificate has a language requirement in which students are expected to devote a minimum of 50 hours to learning a foreign language over the course of the certificate. Finally, students must participate in community service activities of at least 50 hours duration along with a reflective essay. Evaluations of the IBCP suggest that students typically proceed onto tertiary education after completion of the programme. In the United States, IBCP graduates enrol in higher education, particularly institutions offering four-year degrees, at higher rates than the average for high school students and for CTE concentrators (Hopfenbeck et al., 2023[130]; 2021[131]; Lakes and Donovan, 2017[132]; Mack, Halic and Burd, 2018[133]).

The two successful programmes provide models for the ways in which more vocationally focused provision has been made available to students within general programmes of secondary education. The IB programme has been described as the "gold standard for academic excellence" in secondary education (Lakes and Donovan, 2017[132]) and, like P-TECH, tends to be marketed at ambitious and motivated students with a clear vision for life after secondary school.

Within the United States, the last decade has seen considerable private and public support for Career Pathway innovations. At a national level in 2014, a federal Working Group was created to accelerate the development of a wider range of pathways through education into employment. Comprising the White House National Economic Council, the Office of Management and Budget, and 13 federal agencies, the group informed the definition of a "career pathways system" in the Workforce Innovation and Opportunity Act (WIOA) (U.S. Department of Education[2]; U.S. Department of Labor[134]). This framing and an initial national investment of about USD 2.4 billion helped underpin the emergence of new provision across states (America Forward, 2014[135]). In parallel, states have embraced peer learning within newly created learning networks. The Pathways to Prosperity Network, for example, was launched in 2012 following publication of a report of the same name by a team at Harvard Graduate School of Education in 2011 (Symonds, Schwartz and Ferguson, 2011[96]). The aim of the Network, driven by Jobs for the Future, a not-for-profit based in Boston, has been to enhance CTE and related provision, such as Career Academies and Early College High Schools (Schwartz and McKittrick, 2024[136]).

[5] Canada is officially bilingual, with a 76% English-speaking population and 22% French-speaking population (Government of Canada, Statistics on official languages in Canada, accessed 26 June 2024).

6. New Career Pathways: eight approaches

Across the five countries, eight exemplar programmes highlighted by policy officials illustrate the breadth of new approaches to Career Pathway provision. All of the programmes began or were significantly modified since 2014, and most are relatively small, representing under 10% of the students served in a given jurisdiction. Evidence on their relative impact is still emerging. Some programmes are discrete initiatives, in some cases operating within a single school, while others are delivered at national, subnational, or regional levels within related strategies. Common characteristics of the programmes include:

- Development and delivery with industry partners.
- Delivery within general upper secondary education (ages 15–18), with embedded career guidance/career development provision starting earlier in some systems.
- Summative assessments which relate to both programme completion and contribute to certification of completion of general upper secondary education.
- Potential achievement of university credits and/or industry-recognised credentials.
- Targeting of a broad range of learners, not just lower achievers.
- Integration of theoretical, work-related and work-based learning within programme curricula to enable intense career exploration.
- Offering multiple tertiary and career options after upper secondary school.
- A focus on sectors of national, regional and local labour markets facing recruitment challenges.

6.1. Overview of programmes and partnerships

6.1.1. Head Start School-Based Apprenticeships and Traineeships | Victoria, Australia (initiated 2018)

https://www.vic.gov.au/head-start-apprenticeships-and-traineeships

The Head Start programme in Victoria, Australia is designed to enhance the quality and popularity of long-established School-based Apprenticeships and Traineeships (SBAT) (discussed above in Section 3.2) by offering wide-ranging support to students over the age of 15. Students are provided with the opportunity of following programmes of study that relate to a range of vocations and professions. Students undertake a training contract (endorsed by their school), leading to a combination of paid employment and training for a minimum of 13 hours per week. Credit accumulated within the SBAT is counted towards the Victorian Certificate of Education, a summative qualification marking the completion of general upper secondary education (Dept. of Education, Government of Victoria, 2024[137]). Students can also secure a qualification linked to a specialised area of job training. The Head Start initiative, launched in 2018, involves approximately 100 staff working across the state and aims to enhance SBATs by providing students with greater career planning, one-to-one support and quality-assured training in order to better ensure that relevant skills and qualifications for priority industries are acquired by students. The programme allows students to progressively immerse themselves in the workforce while completing their secondary education. For example, a student might go from having paid

employment for one day per week in year 10 (age 15-16) to two or three days per week in year 12 (age 17-18).

Following a pilot phase (2018–22) and subsequent expansion to all Victorian government upper secondary schools in 2023, over 3 300 students have participated in the Head Start programme since its launch. The adoption of Head Start was driven by challenges in the existing SBAT framework, such as declining commencement rates (a general issue across Australia), a perceived lack of support and structure in integrating vocational training within academic secondary education, and challenges in managing the logistics of provision (Firth, 2020[97]; Knight, 2012[138]). Head Start addresses these issues by ensuring that apprenticeships and traineeships are better aligned with industry demands and providing students with a more supportive pathway into potential careers. This is achieved through a team-based approach that includes school-based coordinators and industry specialists who serve as liaisons on behalf of students with employers and Technical Assistance and Further Education (TAFE) organisations which deliver specialist vocational education and training to build a customised model that allows students to adjust their work and study commitments as they progress through the programme.

In response to the Firth Review (2020[97]) and in recognition of a historic differences in the acknowledgement of student achievement within the secondary schooling certificate framework, the state government of Victoria introduced a "Vocational Major" appellation within the Victorian Certificate of Education (the state's existing upper secondary certificate) and the Victorian Pathways Certificate (the state's new "foundation secondary" certificate). Together, these two new pathways superseded the Victorian Certificate of Applied Learning. As of 2023, students could graduate from their secondary education with one of: a Victorian Certificate of Education (VCE); a VCE with a Vocational Major; or a Victorian Pathways Certificate.

6.1.2. Essential Skills Achievement Pathway | New Brunswick, Canada (initiated 2017)

https://www2.gnb.ca/content/gnb/en/departments/education/k12/content/esap.html

The Essential Skills Achievement Pathway (ESAP) Program in New Brunswick, Canada, was launched in 2017 to actively engage high school students more deeply in learning and equip them with a high school diploma that prepares them for post-secondary education, apprenticeship, or direct entry into the workforce. It is part of a broader effort in the last decade to strengthen career readiness called “Future Ready Learning K-12” (New Brunswick Dept. of Education and OECD[139]). Developed primarily in response to concern over student disengagement in education, the ESAP employs a mix of skill-based problem-solving, project-based learning, and on-the-job experiences to prepare students for the workforce or continuing education. The two-year programme is not an additional component but rather the core curriculum for students, culminating in a high school diploma. Depending on their future plans, successful students can choose between a post-secondary Academic, Vocational or Workplace Entry pathway. All pathways require students to engage in experiential, work-based learning, with the Workplace Entry pathway including a mandatory work placement of at least 400 hours (approximately four months). The ESAP serves high school students aged 15-18. It is recommended to start in the second semester of grade 10 (age 15). The programme focuses on foundational learning in the first year and specialised area study with work placement in the second. In 2023, it was fully implemented in 48 of 49 high schools across New Brunswick, engaging about 5% of the province's 75 000 students in over 75 areas of study, including the skilled trades, Information Technology and health services. Graduates earn a certification equivalent to a

general education diploma. It is envisaged that the programme will in time also offer industry-recognised credentials and apprenticeship hours.

6.1.3. South Island Partnership | British Columbia, Canada (initiated 2003; major expansion 2010–2015)

https://camosun.ca/programs-courses/dual-credit

The South Island Partnership (SIP) is a collaborative initiative established in 2003, bringing together Camosun College (a post-secondary educational institution) and five school districts on Vancouver Island in British Columbia. Its foundation is built on the integration of post-secondary education with the high school curriculum, offering dual credit courses in vocational sectors of strategic provincial importance. Credit accumulated contributes both towards certificates of upper secondary graduation and post-secondary provision, including areas of vocational preparation. The SIP provides students with the opportunity to enrol in courses at Camosun College across various fields such as the skilled trades, health, education, and technology. Instruction is designed to offer both academic learning and practical skills, with structures varying from short-term courses to full-time programmes extending up to a year.[6] Credit is also accepted by other tertiary education providers in Canada. Industry engagement is common across provision. It is designed to ensure the curriculum's relevance and alignment with labour market demands. Through the SIP, students thus obtain early exposure to career paths, work experience and technical skills, industry-recognised credentials, and post-secondary credits, all while completing their high school diploma.

After years of pilots and gradual expansion, the initiative received support from the Ministry of Education to dramatically expand dual credit options and student participation from 2010 to 2015 in the context of a province-wide comprehensive career readiness curriculum renewal (Drover-Davidson et al., 2017[140]; Government of British Columbia, 2023[141]); (interviews of Ministry of Education officials, February 2024). Programmes were added based on projected skills needs and student interests, and the number of enrolled students increased significantly (Government of British Columbia, 2023[141]). For neurodiverse students and/or those facing significant barriers to education, SIP and Camosun College also support “Pathways for Life Learning and Work”, a six-week programme, four days per week for students in year 12 or older that prepares them a range of entry-level careers (Camosun College[142]). Annually, the programme now engages over 1 000 students in dual credit courses across trades, sciences, arts, business, and technology sectors. Additionally, SIP facilitates collaboration among career education professionals across the districts serving students K-12 and supports career exploration events for more than 9 500 students.

[6] Typically, students in BC schedule all of their graduation requirements in the first semester of the grade 12 year, leaving the second semester for dual credit attainment in the form of university credits or industry-recognized credentials and certificates. Despite taking post-secondary courses full-time, they are still considered secondary school students as long as they start their dual enrolment courses before they graduate secondary school on June 30th.

6.1.4. Manurewa High School | Auckland, New Zealand (initiated 2012)

https://www.manurewa.school.nz/

This case study focuses on a single school, Manurewa High School (MHS) in South Auckland, which caters to students from years 9–13 (ages 13–18). The multicultural institution serves 2 200 students from over 50 nationalities, including one-half of learners of Pacific heritage, one-third Māori, 12 percent Asian, and 3 percent Pakeha (White). Most students live in low socio-economic communities. Manurewa High School is a partner to a network of 10+ schools as the Trades Academy lead provider in the region and one of the two original P-TECH (see Section 0) schools in New Zealand. This role allows it to offer a specialised Information Technology / Computer Science programme. In 2022 Trades Academy programmes were undertaken by 645 students across the region, including 330 from MHS itself. The school prides itself on providing a broader student experience than is found in most New Zealand secondary schools. Its premises include a garden where students grow vegetables consumed in the school canteen, and students have the opportunity to learn how to drive (a critical skill in accessing work). It also provides students with access to specialised equipment, such as 3-D printers and a maker space to support provision.

The educational approach at Manurewa High School emphasizes the integration of work experience opportunities and industry-relevant skills into the curriculum, particularly through its P-TECH and Trades programmes. These initiatives are designed to ensure that the skills needed in the industry are reflected in the senior secondary curriculum, with content co-designed by the high school, tertiary institutions, and industry partners.

The development of Career Pathways starts with the school's Learner Profile, co-designed with local Indigenous and business communities, detailing desirable skills, capabilities and attributes, which are in turn mapped to the wider curriculum. The school's Business Academy Executive Director, funded through philanthropy, then works with New Zealand's Education Ministry's Business and Employer Liaison and regional Workforce Development Councils to identify pathways that are responsive to the local community and consistent with New Zealand's six national Workforce Development Councils (established in 2019) and the Statement of National Education and Learning Priorities (New Zealand Ministry of Education, 2021[114]). Flexible timetabling plays a crucial role in facilitating partnerships, work experience, and offsite industry training, enabling students to balance between three or four days of in-school learning and one or two days of work placement and/or offsite training.

6.1.5. Westlake Girls High School STEAM Programme | Auckland region, New Zealand (initiated 2017)

https://www.westlakegirls.school.nz/steam-programme/

The STEAM (Science, Technology, Engineering, Arts, and Maths) programme at Westlake Girls High School, launched in 2017, is designed to support girls including those from Māori and Pasifika communities. It aims to close the skills gap and address significant female underrepresentation in the STEM sectors. Spanning three years and targeting students aged 13 to 16 (years 9–11), the programme caters to approximately 150 girls each year, focusing on those interested in pursuing careers within any STEAM sector, most notably in relation to engineering and emerging technologies. Starting in Year 11, the programme incorporates entrepreneurship (this component has the acronym E-STEAM). The programme was motivated by the recognition that less than one in twenty girls consider a STEM career, and those who identify as Māori or Pasifika represent only 5% and 4%, respectively, of New Zealand's technology sector employees—despite constituting about

25% of the population (Maori make up 16.5% and non-Maori Pasifika, 8.1%) (100% Pure New Zealand[143]).

STEAM at Westlake Girls integrates traditional subjects with specialised courses in robotics and an innovation lab. Students engage in hands-on, project-based learning to solve real-world problems aligned with the UN Sustainable Goals. They leverage technologies like app design, augmented reality, and virtual reality to develop solutions and pitch them to the community and present to a panel of female leaders in STEAM roles during an annual event called STEAM Innovation Expo. Projects involve students working collaboratively to identify and address issues in their community, like raising awareness of invisible disabilities or the impact of social media addiction. Year 11 students receive entrepreneurship training in E-STEAM and participate in a three-day mini-internship in industry where they engage in activities designed by employers to deepen their understanding of STEM careers pathways and workplace, engaging directly with industry mentors. Cross-sector partnerships, including collaborations with university-level engineering and technology programmes and tech companies, are designed to ensure that class content and delivery are informed by industry needs and future career opportunities. Interdisciplinary credits earned in E-STEAM contribute towards completion of secondary education leaving certificates. The programme encourages students to pursue tertiary education upon completion of their National Certificate of Educational Achievement (NCEA) with a high percentage of graduates opting for STEAM pathways, including Engineering, Computer Science, and Biomedical fields as school leavers.

While the two New Zealand cases are individual schools, the provision is viewed by the Ministry of Education as contributing towards completion of the national education plan (NELP) (2021[114]) which includes stronger career connections as one of its five priorities. Officials in a new unit in the Ministry dedicated to building such connections identified Manuwera High School and Westlake Girls High School as leaders in the change they wanted to encourage (Interview, April 2023).

6.1.6. Foundation Apprenticeships | Scotland, UK (initiated 2015)

https://www.apprenticeships.scot/become-an-apprentice/foundation-apprenticeships/

Foundation Apprenticeships (FAs) (Cedefop, 2019[144]; Education Scotland, 2022[145]; Skills Development Scotland, 2021[146]) were launched in Scotland in 2015 following the Scottish Government's acceptance of the recommendations of the Developing the Young Workforce review (Commission for Developing Scotland's Young Workforce, 2014[147]) as one means to "develop better connectivity and co-operation between education and the world of work to ensure young people at all levels of education understand the expectations of employers, and that employers are properly engaged" (Scottish Government, 2014[148]). FAs are aimed at students aged 15–18. Within upper secondary education and remaining based in their home high school, students have the option of pursuing one of 15 FAs each focused on broad vocational sectors ranging from Early Care to Engineering. Students can choose a FA as one of five required study programmes for consideration for acceptance into a higher education institution, alongside four other subjects which have an academic focus known as 'Highers'. Usually delivered over two years and occupying around one-fifth of curriculum time, FA students typically spend two half days a week on their area of focus, one day a week learning about the theory in the classroom, and one day in a workplace applying what they learned. Successful completion of the FA leads to an ISCED 3 national qualification (at the same level as Highers) which is recognised by all post-secondary educational institutions within Scotland. In addition, students have opportunity to secure industry recognised qualifications (The Scottish Qualifications Authority [SQA][149]). The FA curriculum is designed to articulate with full-

time Modern Apprenticeships available to school leavers, facilitating progression into post-secondary vocational education and training. As of 2023, some 5 000 students (3.5% of the total number of students in upper secondary education in Scotland) were enrolled on FAs. Initial evaluations indicate promising, if uneven, early development of FAs (Education Scotland, 2022[145]; Skills Development Scotland, 2021[146]). More than half of FA enrolments related to STEM subjects, and that students from ethnic minority backgrounds are over-represented among FA students (Scottish Funding Council/Skills Development Scotland, 2023[150]). More recently, officials in one council area shared data with the study team showing that Foundation Apprenticeship participants stayed in school longer and achieved significantly higher academic performance levels in comparison to peers who had not enrolled in the programme, as measured by Scotland's official 'Insight' data (correspondence with Aberdeenshire Council Developing the Young Workforce and Foundation Apprenticeship officials, March 2024). The difference in academic performance persisted even when comparing students who started in the same year, remained in school for the same duration, and had similar baseline Insight scores, and relative improvement in Insight scores was strongest among those starting at low performance levels.

6.1.7. Delaware Pathways | Delaware, United States (initiated 2014)

https://delawarepathways.org/

Delaware Pathways provides high school students aged 14-18 (grades 9–12) with structured programmes of study that integrate academic and vocational education (Delaware Pathways Steering Committee, 2017[151]). Concerned about high unemployment on the heels of the financial crisis of 2009–2011 and the concerns of employers that they could not find the talent they needed, in 2014 the then-Governor, drawing heavily on a report called "The Forgotten Half" (Symonds, Schwartz and Ferguson, 2011[96]), initiated policy reform in collaboration with public and private sector players. In concert with national nonprofit Jobs For the Future, a statewide strategic plan was developed. Starting with one pilot of two dozen high school students working with Delaware Technical Community College, the state's only community college system, and an employer in advanced manufacturing, the state expanded provision from 27 students in one pathway to almost 32 000 students in 27 pathways a decade later (Bellwether, 2023[152])[7].

Career Pathways in Delaware consist of three or six aligned, state-approved, Career and Technical Education study courses consistent with any one of 24 pathways (Delaware Pathways[153]). The courses count towards secondary school graduation and are paired with a work-based learning experience, access to one or more industry-recognised credentials when feasible, and up to 15 higher education credits. Students start on their chosen pathway from grade 9 (age 14–15) with provision integrated into their regular school schedules. Programmes emphasize work-based learning, including internships and job shadowing, to provide practical and real-world skills with well over 100 employers involved in curriculum development and work-based learning provision every year (Delaware Office of Work-Based Learning, 2023[154]).[8] As of 2023 Delaware's Career Pathways were offered within 13 career clusters such as Health Sciences, Information Technology, and Engineering.

[7] The most recent numbers (31 827 students in 27 pathways) are from the school year ending in 2023. Data sourced from Career and Technical Education Unit, Delaware Department of Education (June 2024).

[8] The Delaware Office of Work-Based Learning (DOWBL) had formal agreements with 115 employers in 2022-2023 (454 cumulatively since 2020). This is an undercount that excludes relationships that schools make directly with employers outside of DOWBL agreements.

Individual high schools offer a subset of pathways to choose from based on their local labour market needs, resources and staffing capacity. For example, a high school near the state's beaches might have an expanded Hospitality or Culinary Arts pathway along with a mix of other pathways from Life Sciences to Education. In 2021, the Tech Council of Delaware was created to better connect students to the growing IT and biotech industries. By 2023, all public high schools in the state offered a mix of pathways, and over 65% of high school students (32 000 in total) were enrolled, with more than 20% earning postsecondary credits before graduation (Bellwether, 2023[152]; Delaware Dept. of Education, 2024[155])

In 2023, the working group of public and private sector leaders charged with implementing and improving Delaware Pathways focused on three areas of opportunity for further development of Career Pathways provision: building more consistency in the quality of work-based learning experiences; creating a longitudinal data system to better track how well the investments at the high school level were translating into post-secondary education and career success; and, supporting a statewide pilot to start Pathways in the middle grades (grades 6–8, students ages 11–13) (Delaware Pathways[156])

6.1.8. Rural Schools Innovation Zone | Texas, United States (initiated 2019)

https://www.thersiz.org/

The Rural Schools Innovation Zone (RSIZ) is a partnership of rural school districts and higher education institutions in South Texas established to share resources and offer expanded post-secondary educational and career opportunities to students across member districts. Launched in 2019, the RSIZ has grown from three to five school districts that collaborate to develop region-specific solutions and facilitate access to study programmes and instructors that students in these areas traditionally could not access. RSIZ offers five CTE academies (a school within a school)—in the Skilled Trades and Technology, Health Science, STEM, Education, and Military Leadership—designed to prepare students from the age of 15 for specific career paths and tertiary education pursuits (The Rural Schools Innovation Zone [the RSIZ][157]). The academies offer students the ability to earn credits for use in tertiary education up to an Associate's degree and industry-recognised credentials (Pankovits, 2023[158]).

The partner districts provide necessary transportation and maintain a unified approach to timetabling and other district policies, ensuring that students can benefit from RSIZ programmes while remaining enrolled in their home schools. Based in a large region, students travel up to 90 minutes back and forth two days per week to an academy of choice. It is not uncommon for learners to take a bus at dawn, engage in their CTE study programmes for 90 minutes, return on the bus, and then engage with their peers in their home school for the rest of the day.

Approximately 40% of eligible students across the five high schools participated in the 2021-22 academic year. All five academies are on track to becoming P-TECH schools by 2024. Each offers educational tracks that integrate academic learning with career-specific coursework, including dual enrolment in community colleges, and provides opportunities for work-based learning experiences ranging from provision within simulated settings to internships and summer work. Almost two-thirds of RSIZ students from the 2021-2022 graduating class earned industry-based certifications, compared with a state average of 25%, and RSIZ students have double the percentage of students completing dual enrolment courses (26%, versus 13% statewide) (the RSIZ, 2021-22[159]).

6.2. Comparison of programme attributes

Despite sharing the eight core common attributes listed earlier, the eight approaches of focus for this paper also vary in several ways. Programmes are located at national (Foundation Apprenticeship in Scotland), sub-national (School Based Apprenticeships and Traineeships in Australia; Essential Skills Achievement Pathway in New Brunswick, Canada; and Delaware Pathways in US), regional (Rural Schools Innovation Zone in Texas, US and South Island Partnership in British Columbia, Canada), and school levels (Manurewa High School and Westlake Girls STEAM in Auckland, NZ). Table 7–Table 9 compare the eight approaches across three additional dimensions: the range of subjects or areas of provision across programmes; the target population and size of the efforts; and the nature of applied and work-based learning experiences.

Table 7 shows that available subjects, or potential "pathways", vary considerably across jurisdictions. In Victoria, Australia, the School Based Apprenticeship and Traineeship programme with Head Start offers options for "traineeships" or internships from a wide range of industries, while the range of options in the two school-level efforts in New Zealand (Westlake Girls and Manurewa High Schools) are narrower. Five programmes offered around 10 to 25 pathways with common options including: the skilled trades, education, healthcare, information and technology, and engineering. Notably, despite interests among policymakers to respond to emerging industries like the need to expand talent pipelines in areas like "green energy" (alternative energy) or computer chip production and cybersecurity, provision within the pathways focuses on subject fields long-established within Career Pathway delivery. In an interview about this apparent disconnect with one higher education official in the US, the response was, "We aren't building out the training and certification processes until there are actual jobs for students to enter" (Higher Education official in Delaware, January 2024). This speaks to the complexity of aligning the education and training systems in a jurisdiction to the rapidly changing needs of the global economy.

Table 7. Subjects or areas of study available in eight Career Pathways programmes

Programme	Available subjects
School Based Apprenticeship and Traineeship (SBAT) with Head Start (Australia)	SBATs available in a wide range of industries including building and construction, trades, community services, early childhood education, health, digital media and technologies, hospitality, and engineering.
Essential Skills Achievement Pathway (Canada)	Over 75 areas of study are available including: Skilled Trades, Transport and Equipment; Sales, Service and Office Work; Processing and Manufacturing; Natural Resources and Agriculture; Health Services; Information Technology; and Design.
South Island Partnership (Canada)	Over forty programme areas are available including: Business, Health & Human Services, Trades, Technology, Sport & Exercise, Arts & Science, Access, and University Transfer.
Manurewa High School (New Zealand)	Trades Academy in 2022 offered Pathways in: • Construction • Engineering • Hospitality • Logistics

	Additional Pathway opportunities are available through the school's Business Academy, IT Partnership with P-TECH and an Education to Employment programme where final year students engaged in paid work with training in logistics, engineering and transportation. Students also have access to driving lessons, a Maara (garden) and an innovation space to build tools and content to support business ideas.
Westlake Girls STEAM (New Zealand)	The areas of study include careers in Science, Technology, Engineering, Arts, and Mathematics field. The "E" represents "entrepreneurship" in that students are also encouraged to pursue starting their own ventures. The intent for most of the girls in this programme is to pursue tertiary education in preparation for careers in a range of STEAM fields ranging from engineering to cybersecurity.
Foundation Apprenticeships (Scotland)	FAs are available across the following subject areas. At ISCED 3 (age 16–18): • Accountancy • Business Skills • Civil Engineering • Creative and Digital Media • Engineering; Financial Services • Food and Drink Technologies • Hardware and System Support • Scientific Technologies • Children and Young People • Social Services and Healthcare • Software Development At ISCED 2/3 (age 15-16): Automotive; Construction; Hospitality
Delaware Career Pathways (United States)	24 Pathways are offered through 13 career clusters: • Agriculture, Food & Natural Resources (AgriScience) • Architecture & Construction • Arts, A/V Technology & Communications • Business Management & Administration • Education & Training • Finance Careers • Health Sciences • Hospitality & Tourism • Information Technology • Manufacturing • Marketing • Science, Technology, Engineering & Mathematics (STEM) • Transportation, Distribution & Logistics
Rural Schools Innovation Zone (United States)	Five academies focus on specific college and career pathways are open to all RSIZ students: • Construction • Welding • HVAC (Heating Ventilation and Air-Conditioning) • Electrical • Heavy Equipment • Medical • Information Technology • Education

	• Paraprofessional and Educator Aide • Military

Table 8 reinforces a core attribute common to all eight approaches: a focus on senior secondary students. The socio-economic profile of students in these eight programmes ranged from predominantly low-income in the Rural School Innovation Zone (US) and Manurewa High School (NZ) to higher income in Westlake Girls High School (NZ), but the majority of programmes were intended to serve a cross-section of students pursuing a broad range of career options. The size of enrolment in these Career Pathway programmes are generally still small, representing less than 10% of the student population in six of the eight approaches above. The exceptions are Delaware Pathways (US), in which participate over 65% of the state's secondary students, and the Rural Schools Innovation Zone (US), which engages about 40% of the students in the five participating high schools. The challenges to achieving scale and efforts to overcome them are discussed in Section 7.

Table 8. Student profiles and participation levels in eight Career Pathways programmes

Programme	Target student age and social characteristics	Size (enrolment)
School Based Apprenticeship and Traineeship (SBAT) with Head Start (Australia)	State-based. Students aged 15–18 (Years 10–12)	2 500 students in pilot initiative 2018-2022 (2% of the 116 000 Victorian government school students in years 10–12 in 2021). Expanded access to all government schools in 2023.
Essential Skills Achievement Pathway (Canada)	Province-based. Students aged 15-18 (Years 10–12)	About 2 500 students in 2022 (3-6% of 75,000 New Brunswick high school students). Expanded to 47 of 49 high schools in 2023.
South Island Partnership (Canada)	Regional focus. Students aged14-18 (Years 9–12)	Provides dual enrolment on the Camosun College campus to about 6%, or 1 000 of approximately 16 000 secondary students across five districts. Impacts more students through collaboration across the districts K-12.
Manurewa High School (New Zealand)	School-based. Students aged 14–18 (Years 10–13): 97% are non-white, and predominantly drawn from the most socially disadvantaged 10% of communities	Full student body of approximately 2 200 students.
Westlake Girls (New Zealand)	School-based. Students aged 13–18 (Years 9–13): predominantly drawn from the most socially advantaged 10% of communities	About 150 of the school's 2 200 students (approximately 7% of the student body).
Foundation Apprenticeships (Scotland)	National model. Students aged 16–18 (Years 11–12)	About 5 000 students across 32 local authorities, or about 3.5% of Scotland's total senior secondary population of 140 000 students.

Delaware Career Pathways (United States)	State-based. Students aged 14–18 (Years 9–12)	About 30 000 of the students (or about 67% of the state's 45 000 senior secondary students) are engaged. All 56 of Delaware's public high schools offer a mix of career pathways. Pilot started in 2023 of 5 500 middle grades students (or about 18% of all students in grades 6-8).
Rural Schools Innovation Zone (United States)	Regional focus. Students aged 14-20 (Years 9-14): a majority (90%) are designated low-income	1 274 students (or about 40% of the 3 185 eligible students in the five secondary schools participating).

Provision of work-related learning and work experience across the eight Career Pathways exhibit similarities and differences in their structures, goals, and extent of work-based learning (Table 9). In the School Based Apprenticeship and Traineeship (SBAT) in Australia and the Essential Skills Achievement Pathway in New Brunswick, Canada, students progressively increase their workplace engagement, combining part-time work with structured training. Similarly, Scotland's Foundation Apprenticeships involve consistent work placements equivalent to one day a week integral to gaining practical skills. In contrast, other approaches are more flexible in their provision. The South Island Partnership programme in Canada mandates a minimum number of hours of practical career preparation and offers, but does not require, apprenticeship training and opportunities to earn college credit. In Manurewa High School (New Zealand), students participate in work placements and on-campus businesses not strictly structured by year but rather by student readiness and partnership opportunities. Combining the two, the Delaware Career Pathways in the United States requires all students to engage in a range of career awareness activities that may include job fairs, job shadowing, volunteerism, and virtual tours (Appoquinimink School District[160]), and in addition offers a wide range of work-based learning experiences, with some students engaging in extensive clinical hours while others completing minimum requirements, depending on the pathway.

Differences are also evident in the articulation with continuing education and training. In Australia and Scotland, provision is designed to articulate with post-secondary training provision. In Canada and the United States in addition to such articulation models, students have opportunity to begin accumulating credit, notably through 'early college high school' and dual enrolment programmes, recognised by tertiary education institutions. The P-TECH model in the Rural School Innovation Zone allows for students to complete an Associate's degree, or two full years beyond senior secondary school.

Table 9. Career-connected learning and work experience in eight Career Pathways programmes

Programme	Applied and work-based learning options, duration, and intensity
School Based Apprenticeship and Traineeship (SBAT) with Head Start (Australia)	Students contract with employer typically increases from 1 to 3 days per week from Years 10-12. Typically, one day per week in year 10; two days per week in year 11; and three days per week in year 12. All SBAT students must undertake a minimum, on average, of seven hours per week of paid employment, and a minimum of 6 hours per week of structured training. Students can receive credit for their SBAT towards their Victorian Certificate of Education (VCE), VCE Vocational Major, or a Victorian Pathways Certificate (VPC) which is more flexible and inclusive approach for students not ready to complete a VCE (Government of Victoria[161]). SBAT students can work at their place of employment on weekends and school holidays. Provision articulates with post-secondary apprenticeship/traineeship programmes.
Essential Skills Achievement Pathway (Canada)	There are two paths based on post-secondary intentions. "Postsecondary Pathways" for those pursuing either an apprenticeship or higher education; and "Workplace Entry Pathways" for those looking to enter directly into the labour market. Year One is foundational learning in nine essential skills (reading writing, numeracy communication, digital literacy, collaboration, adaptability, problem solving, creativity, and innovation). Year Two is focused on postsecondary pathway or workplace readiness. And year three includes a capstone project or at least 400 hours (approximately four months) of workplace experience.
South Island Partnership (Canada)	Five British Columbia school districts, in partnership with Camosun College, provide students with access to a broad range of programmes designed to articulate with post-secondary higher education or apprenticeship courses (SkilledTradesBC[162]), earning credit towards their completion. During secondary school, students complete at least 30 hours of school-authorized career-life exploration, which may include paid career preparation or volunteer experiences, and all students are required to complete two courses on career readiness and life and a capstone project that articulates their plan after secondary school. Apprenticeship students can take up to four courses where they are earning up to 480 hours of work-based learning (120 hours/course). Generic work experience placement in British Columbia generates four credits (of 80 required for graduation).
Manurewa High School (New Zealand)	Work-based learning experiences vary from paid work-based learning two days per week to engagement with on-campus businesses, like the school's Maara (garden) and on-campus canteen. The range of options include a partnership with P-TECH in which the school worked with industry and tertiary partners to co-design and deliver a curriculum in STEM fields. Likewise, the school co-designs curricula across the Skilled Trades, often including students working with flexible timetables that allow them to be in a work-placement one to two days per week with one of 40 employer partners while maintaining participation in core academic courses. The school has established the partnerships necessary for students to gain qualifications and licenses. Certifications are delivered by external providers and include credentials such as a forklift license, a first aid certificate, and the Ministry of Primary Industries (MPI) accreditation, which allows certificate holders to open containers from overseas ports.
Westlake Girls STEAM (New Zealand)	The STEAM programme offers an integrated approach to learning that strengthens links between traditional subjects through project-based learning. In years 9 and 10 the programme includes course such as robotics, papertronics, and innovation lab which involves using emerging technologies such as augmented reality and 3-D printers to encourage problem-solving and

	leveraging technology to address challenges aced in their local community linked to UN Sustainable Development Goals (Westlake Girls High School[163]). In years 11 and 12, students continue building STEAM skills while developing their own ideas as entrepreneurs and engaging with local employers through internships, particularly with women role models in emerging industries. To gain on-site experience, students participate in a career expo with a broad range of employers in panel discussions and in "mini-internships" of 1–2 days each across three companies ranging from a major insurance company to a merchandiser and a power company (Westlake Girls High School[164]). These experiences do not yield certifications in a given field but are meant to inform the student's group projects as well as their tertiary education and career choices.
Foundation Apprenticeships (Scotland)	Foundation Apprenticeships (FAs) generally involve students engaging at a workplace one day per week in a field linked to their subject of study. Additionally, students undertake theory classes for part of one day per week. Work placements are not paid, as they are considered part of their school learning. FAs articulate with post-secondary apprenticeship provision, but also enable progression towards higher education. Employers are provided with guidance and support to ensure a high-quality student experience (The Scottish Qualifications Authority [SQA][149]).
Delaware Career Pathways (United States)	All students undertaking a Pathway must participate in work-based learning experiences. These vary considerably across the state, from a 50-hour minimum work placement typically in a student's final year of upper secondary education (Appoquinimink School District[160]) year to an outlier, more intensive, work-based learning experience of over 600 clinical hours over two years associated with the patient care technician pathway.
Rural Schools Innovation Zone (United States)	Students across the five vocationally-focused academies spend at least part of two days per week at their academies undertaking career and technical education courses, engaging in work simulations, and training. Work-based learning is not required, but many opportunities are provided for internships and summer work experiences.

The models in different ways represent attempts to increase the attractiveness of provision to students, parents, employers and schools. In comparison to historic forms of Career Pathways (Section 3), and consistent with the motivations driving policymakers across countries (Section 5), new provision typically offers greater student choice, more coherent learning journeys, deeper employer engagement and richer learning experiences, underpinned by stronger cross-school coordination that can better address the needs of students as well as those of the broader economy and society.

For students and their parents/carers, new provision provides substantially expanded curriculum choice, including opportunity—as in New Brunswick, Canada and Victoria, Australia—to personalise and customise provision. For potential students, programmes address potential concerns which might be associated with pursuing such provision. As in traditional Career Pathways delivery, students are not required to leave their home secondary school, and it is anticipated that they will complete general certificates of completion of upper secondary education. In Canada and the United States, students have more consistent opportunity to earn credit towards tertiary qualifications. Strong employer engagement in programme design and delivery can be expected to increase confidence in provision. Substantial work-based learning components are designed to enhance the authenticity and value of learning to employers, proximal experiences that can be expected to build the social capital (as well as the human capital) of students. This also provides a means to articulate programmes undertaken at secondary level with post-secondary apprenticeships, providing relevant preparation experiences and, in some cases, credit towards their completion. Reputational questions are also addressed by the common involvement of higher education institutions within provision, including opportunities as

in British Colombia, for students to spend time learning on the campus of a tertiary partner. In these ways, attempts are made to increase the confidence of students and parents in such provision.

For employers, growing infrastructural support, as in Victoria, is designed to make it easier to engage effectively and efficiently with schools. By articulating provision with work-based programmes of post-secondary skill development, employer confidence, and willingness to engage, in-school offerings can be expected to grow as the relevance to recruitment of interested and well-prepared young people becomes more transparent. Stronger alignment with labour market demand, as in the Foundation Apprenticeships in Scotland or the schools cited in New Zealand build the confidence of employers that these pathways will meet their talent needs. Infrastructural support also enables schools to broaden their offer through facilitated collaborations, as in Texas, where students travel between different schools to undertake provision. The development of regional intermediaries, like Developing the Young Workforce in Scotland or the Office of Work-Based Learning in Delaware, also enables more diverse opportunities for employer engagement by helping to manage competition between schools for the attention of industry partners.

In these ways, the new generation of Career Pathways can be seen to build upon historic programmes to offer more strategic and integrated provision in which students (and other stakeholders) can have greater confidence that participation will lead to learning outcomes and certifications that significantly increase the opportunity for employment within a sector of interest without closing off other options. In such ways, deep and safe career exploration is enabled. However, within this drive to broaden and enhance provision, common challenges have been encountered.

7. Overcoming challenges to transformational change

> *"I have read the Shergold recommendations and I agree with them because I have seen the benefits for our students when they have meaningful work-based learning experiences, but at the same time, parents, many of whom are immigrants striving for a better life for their children, are very focused on their child performing well on the ATAR (Australian Tertiary Admission Rank) to get into 'uni' and they don't want them to do anything—like doing a work placement offsite—that could diminish their chances to get into the university of their choice. I'm also still evaluated by how well our students do on the ATAR and core subject exams, so the incentives haven't changed. And by the way, I'm short staffed. Right now, I've got quite a few students sitting in the library doing 'self-directed learning', because I'm down a teacher. Bottom line, I agree with where we want to go, but it's really hard to get there." – interview with school principal, New South Wales.*

As the quote above illustrates, redesigning the schooling experience while practitioners are working day-to-day to deliver is an inherent challenge. With Career Pathways, policymakers aim to create engaging and relevant schooling experiences enjoyed equitably, to prepare all students for post-secondary success in a changing world, and to meet the talent or skills needs of business and the economy. To those ends, recent approaches have sought to improve on existing models by offering more strategic and coordinated provision which looks to balance the tension between student-centred design and the needs of employers. Achieving these objectives involves a wide set of challenges. In the sections that follow, three challenges that emerged across the eight case studies are discussed:

1. Implementing, scaling, and maintaining ambitious institutional change;
2. Making programmes attractive and effective for all students; and
3. Ensuring equitable access.

7.1. Implementing, scaling, and maintaining ambitious institutional change

By design, Career Pathways inherently require collaboration with external partners; responsiveness to student and local economic demands, teachers and employers with industry insight, new teaching styles, and timetabling; and three-way connections across secondary schools, higher education institutions, and employers. In discussions between the project team and innovation leaders, it was apparent that school systems often lack a roadmap to change, the means to implement it, or the data to learn and continuously improve. Once launched, Career Pathway programmes often struggle to achieve scale. Providing a rich set of options to students depends on having the infrastructure to support students in making these transitions and a critical mass of student interest. As described in Section 0, the constraints of funding can be an obstacle to scale. For example, in the US, the heavy influence of philanthropy can lead to a broad range of innovative ideas disconnected from systemic change; or in jurisdictions like Scotland, with more federal control, the pace and direction of change is dependent on the ability of political leadership to align. Moreover, given that connecting students to work placements and higher education partners represents additional costs, education jurisdictions face constraints in providing the full range of potential pathways in every secondary school. These challenges to scaling are illustrated by the fact that most programmes studied in this paper serve less than 10% of public school students within the relevant jurisdiction. Finally, programmes are at risk

of stalling or shifting focus owing to political and administrative change. Policymakers and practitioners addressed these challenges in two ways.

7.1.1. Independent expert reviews to build consensus and engagement

Independent expert reviews can enhance the potential of education reform efforts withstanding political change, providing stakeholders with greater confidence to commit to engagement. In fields such as career and workforce development where stakeholder engagement from across the worlds of education and employment is essential and responsibilities divided across government ministries, such approaches provide means of accelerating policy innovation if requiring governments to accept some loss of control over policy development. As Rowe and McAllister (2006[165]) argue, appointment of independent commissions is commonly driven by desires to identify solutions to long-standing challenges engaging multiple stakeholders:

> *Creating [independent commissions] is to cede some control over the process and the conclusions. No matter how cynical a view one takes, it will always be the case that the surest way of reaching the conclusion one desires is to exclude others from the discussion. The very appointment of a commission opens the possibility of the unexpected or the unwanted. Ministers and their senior advisers are conscious of this. Yet independent commissions, inquiries and reviews remain remarkably durable. This is almost certainly because they can clearly make significant and meaningful contributions to the policy process and, more importantly, to different policy outcomes.*

In Australia, for example, the national Shergold Review and the Victoria-specific Firth Review, both released in 2020 ([97]; [102]), drove changes such as the creation of the change in qualifications, investments in Head Start, and a statewide investment in change management.

In New South Wales, the Ministry of Education acted on the Shergold Review by investing in dedicated units, such as the Regional Industry Education Partnerships programme which had 26 staff working full time to connect employers and schools statewide (Box 2). In Scotland, the Wood review (2014[103]) notably set the stage for the launch of Foundation Apprenticeships and the national agency tasked with implementing that programme, Skills Development Scotland (SDS). SDS has fostered the growth of Foundation Apprenticeships from a few hundred students in 2015 to approximately 5 000 in 2023. In Delaware, the Vision 2015 plan (Vision Coalition of Delaware, 2006[166]), a report published by a public-private coalition, established a ten-year vision that helped the state win the top score and $119M USD in a federal competition, called Race to the Top, as well as build continuity of focus over time (Jenkins and Wisdom, 2014[167]).

In discussions with the review team, Angie Calleberg, Executive Director for Student Learning in British Columbia, underscored the importance of the review process but acknowledged that it was only the beginning of a reform process, since meaningful change would require years of effort with continuous engagement and buy-in from stakeholders to succeed. Offering advice about BC's transformation of their definition of an educated citizen and the K–12 curricula to include career readiness as one of its three pillars, she noted:

The hallmark of what we've accomplished together was an open and transparent process, and being able to bring in every single perspective that's going to want to have a voice within those processes is absolutely essential. Starting with a very strong research foundation will serve a jurisdiction incredibly well, and it's a pivotal tool for governments to be able to work with their political leaders and bring them along in systems change approach. ...I would highly encourage [other jurisdictions interested in such policy reform] to think about building in implementation from the beginning. Recognising that change doesn't happen overnight and that just completing the update or something like a curriculum or assessment, that's not implementation. It's more about walking people through those changes and making sure they have the information and the tools to be able to support them in their work, to be able to support our students, but more so as well, to support families through the change processes. Everyone has something to say about education and I think that's actually the beauty of the work that we do is to be able to invite all those voices in. (Interview, February 2024)

7.1.2. Leveraging workforce development funding and building dedicated intermediaries and partnerships

Career Pathways are more effectively delivered where they are not an isolated effort. Successful implementation requires systemic changes to the delivery and infrastructure of public education. They also involve additional spending. Across the countries visited, a range of efforts were evidenced to manage, fund, and scale implementation of new Career Pathways. A key theme within funding approaches has been the recognition that skills policies, which are typically focussed on adults, will be more effective if resources are devoted to supporting relevant provision undertaken during secondary education.

A common role across jurisdictions is the establishment of organizations in either the public or private sector that serve multiple roles to enable implementation, such as undertaking research to inform targeted investments and liaising between policy makers and the delivery community. In Scotland, Skills Development Scotland (SDS), a national agency, has 1 300 employees focused on skills development. Half of SDS staff are located in each of the country's 350 high schools, ensuring coherence from the national to the school level in terms of data and messaging. SDS works closely with the country's 32 local authorities tasked with education delivery. Within a national skills budget of over GBP 2 billion, SDS has a budget of some GBP 200 million to support around half of Foundation Apprenticeships (the other half is funded by the Scottish Funding Council). In addition to building implementation strategies, SDS is responsible for developing industry-designed standards with employers and communication strategies to influence parental and public thinking in relation to more vocationally focused educational pathways. In Scotland, this intervention aligns and articulates education and training provision at secondary and post-secondary level. Graeme Hendry, Head of Government, Parliamentary and Stakeholder Engagement (Skills Development Scotland), noted:

> *Foundation Apprenticeships are part of our school system and involve a complex mix of stakeholders including schools, colleges, learning providers, local authorities and employers as well as government. As they were introduced into the system it was key we had a team to act as "the glue" to bring those different parts of the system together. Sometimes it happened naturally but often it needed people with the right skills to make the connections and build partnerships to embed it as business as usual (Interview, June 2023).*

In the United States, federal and state governments have looked to supplement education budgets with resources aimed at workforce development. (See Section 3.1, An Historical Perspective: United States for a discussion of the evolution of federal investments in workforce development.) The approach recognises that investment at a younger age has the potential to reduce costs to adult individuals and the state in enhancing skills supply and support for Career Pathways delivered in secondary education is common within workforce development skills strategies. The coalitions that maintain the scale and sustainability of Career Pathways in the US are often composed of public and private sector leadership teams. A significant portion of funding comes from the federal government, especially through line items in the Carl D. Perkins Acts and Workforce Innovation and Opportunity Act (WIOA) (The Association for Career and Technical Education [ACTE][168]). However, because the constitutional responsibility for public education is largely devolved, it is state agencies in cooperation with local non-profit intermediaries, like Educate Texas in Texas and Rodel in Delaware, which work together on communications, state allocations, and proposals to generate national and local philanthropic resources. In Delaware, such a partnership has directed funding toward Pathways by developing common definitions for measuring student impact and accountability, enabling the state to integrate or 'braid' federal resources from the Departments of Labor and Education into school provision funded at the state level. Historically, these two sources of funding were siloed and parallel efforts, but since they were serving the same students, by simply realigning the reporting and accountability structures, Delaware officials were able to leverage far more resources against a common, coherent plan (Bellwether, 2023[152]). Similarly, in Texas, coupled with philanthropic investments (Texas Education Agency and SRI International, 2011[169]), the state government in 2023 provided USD 683 million to create 276 P-TECH high schools and help community colleges align to a similar set of college and career metrics as being introduced in secondary education, systemising the availability of dual credit attainment (Texas Education Agency, 2024[170]).

As intermediaries liaising between political, industry, and nonprofit leaders, the non-profit organizations in Delaware and Texas also help maintain the continuity of efforts across administrations. In the case of the transition of Delaware's gubernatorial leadership in 2016, a mix of public and private sector leaders ranging from CEOs to trade union, state, and district leaders, called the Vision Coalition, worked with the new administration to maintain the momentum of the prior administration, resulting in the establishment of a gubernatorial steering committee and investments from large philanthropies coupled with state and federal resources. Rather than stalling, the Pathways programme that had begun in the previous administration as a pilot of 27 students had by 2023 expanded to all secondary schools in the state (Bellwether, 2023[152]; Vision Coalition of Delaware[171]).

In Victoria, Australia, a Senior Secondary Pathways Reform Taskforce (SSPRT) was established and has dedicated more than AUD 100 million annually over five years to drive transformational reform to the delivery of upper secondary education at the state level. The Taskforce was launched soon after November 2020, when the Victorian Government accepted in principle all recommendations from the Firth Review, and is set to cease operations in mid 2025. The SSPRT has a team of more than 80 people dedicated primarily to policy and programme design and implementation, building new partnerships with employers, supporting schools through a dedicated regional workforce, and communicating with the general public to change perceptions of vocational pathways in school and post-school. It has also built the Head Start Support Network that works with students to help them source successful work placements. Victoria has 12 Head Start regional hubs, and as of April 2023, 107 state-funded Head Start staff worked directly with students. In addition,

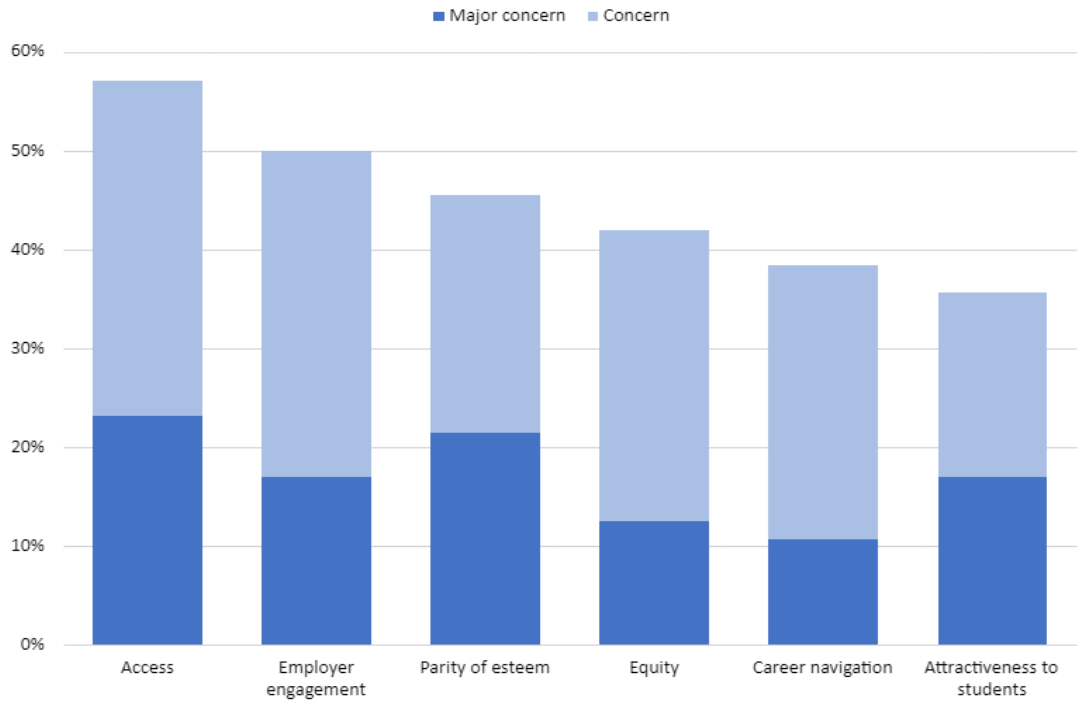
another 50 state employees provide support across the state's regions to liaise between employers, tertiary providers and schools.

7.2. Making programmes effective and attractive for all students

Career Pathway programmes face significant challenges in effectively bridging the education-to-employment gap. These include limited access to specialised teaching provision and work placements, the persistent stigma surrounding vocational learning, the need for much more cross-sector collaboration, the move from a voluntary choice into a small learning community to a systemwide shift for all students, and the misalignment between educational curricula and the evolving needs of the labour market. These barriers may hinder the effectiveness of such programmes and deter student participation undermining the quality of provision and its perception by stakeholders. Such obstacles have been addressed through cross-institutional collaboration, articulation of high school and tertiary pathways, close engagement with employers, and dedicated entities connecting students to work and training.

A survey of officials and stakeholders engaged in Career Pathway delivery in all five countries undertaken by the project team shows the degree of concern across six potential challenges to Career Pathways (Table 10). Such barriers to effective provision are subject to ongoing action by policy teams. The leading concern relates to the logistics of transporting students to work-based learning locations, while the least frequent concern relates to programme attractiveness to students. The responses highlight the belief that the attractiveness of provision will reflect its actual quality and recognition that continuous improvement is required to further enhance quality of that provision.

Figure 3. Degree of concern across six areas of Career Pathways among administrators, policy makers, and other stakeholders in five countries, 2023–2024

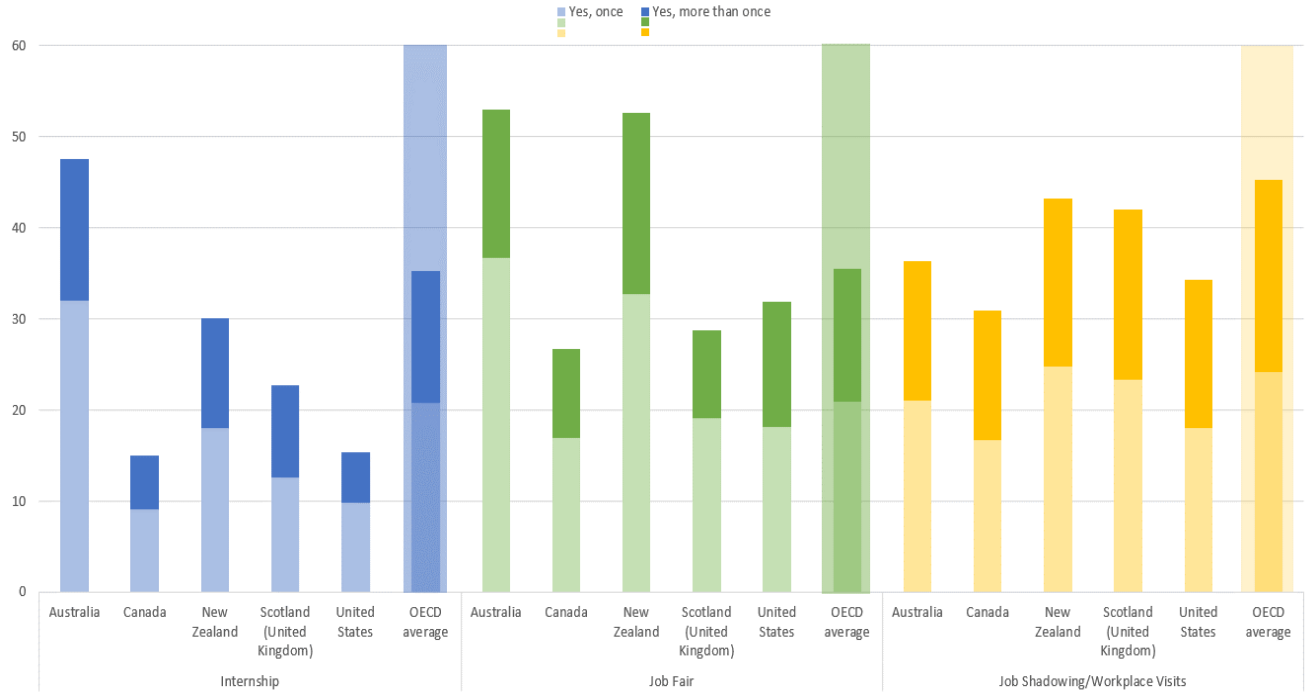


Note: Survey of 112 Career Pathways officials and stakeholders across the United States, Canada, Scotland, Australia, and New Zealand across March 2023 – March 2024 (see breakdown of respondents in Table 3). This figure shows the percentage of respondents indicating, for each attribute, that "some" (4) or "much" improvement (5) was needed (out of a 5-point scale) in response to the question, "As the career pathways with which you are engaged continue to evolve, please assess the areas you believe need to improve by rating each one." There were six areas in total (all shown in the figure). Challenges are defined in the survey as follows. Access: Need for scalable solutions to get students to and from training and work-based learning. Tracking Equity: Need to increase supports for those for whom full engagement in career pathways take more effort and support. Career navigation: Need to improve supports for students looking to make good choices in high school and beyond. Parity of esteem: Need to normalize that a four-year degree is just one path to a good job. Attractiveness: Need to ensure that career pathways are seen as attractive learning programs for all students. Employer engagement: Need for increased co-ownership with employers.

7.2.1. Employer-informed curricula and work-based learning to ensure learning relevance

It is now widely accepted that employer engagement is an essential element of teenage career development (The Inter-Agency Working Group on Career Guidance [WGCG], 2021[172]; OECD, 2021[173]). However, as PISA 2022 demonstrates, on average across OECD countries, only minorities of students by the age of 15 have engaged in important forms of such engagement. By this age, 33% of students in OECD countries have completed an internship, 45% job shadowed or visited a workplace and 35% attended a job fair. In these respects, on average students from the five countries which are the focus of this study tend to perform below OECD averages (Figure 4).

Figure 4. Participation in three forms of career development engaged with employers.



Source: OECD PISA 2022 database

Employer engagement is essential to the effective delivery of work-related learning (Huddleston and Stanley, 2012[5]). However, as survey data across the five countries highlights, doing so at scale presents important challenges. Half of respondents expressed moderate or major concerns with employer engagement, the second largest concern overall. Without such engagement instruction is less likely to be responsive to patterns of employment demand, skills training is less likely to be up to date, and employers ultimately are less likely to see graduates of related programmes as desirable potential recruits (OECD, 2010[94]). Early and integrated engagement with the economic community can encourage buy-in from employers, ensure provision that is relevant to the contemporary working world, and give students confidence that programmes of study will facilitate entry into desirable employment (OECD, 2022[174]).

Some jurisdictions in this study have worked backward to map the design of their curricula from the employers' needs. In Scotland, Skills Development Scotland works with employers through Technical Expert Groups to design curricular standards and has a team that not only analyses labour market data nationally but also provides staff in each high school to help students to access and make sense of information. The state of Delaware created a statewide Office of Work-based Learning within Delaware Technical Community College and, in response to a growing tech sector, created the Tech Council of Delaware, an organisation designed to serve as an intermediary among tech employers and the training providers and community-based organizations working to connect youth and adults to good careers in the sector.[9] In New Brunswick, Centres of Excellence (https://centresofexcellencenb.ca/) have been established in recent years in relation to the skilled trades and manufacturing, energy, health, entrepreneurship, digital innovation and language learning as intermediary bodies designed to connect schools and employers to

[9] Tech Council of Delaware (www.techcouncilofdelaware.org).

support a range of different career development programmes linked to areas of strategic economic importance. In Victoria, additional Head Start funding is designed to make it easier for employers and schools to work together. In New South Wales, this role is undertaken by the recently created by the state Ministry of Education in the form of the Regional Industry and Education Partnership (New South Wales Dept. of Education[175]). New Zealand launched a new unit in their Ministry of Education in 2022 to facilitate employer engagement in education and in 2023 introduced Inspiring the Future Aotearoa (https://www.inspiringthefuture.org.nz/#/), a programme designed to use digital technologies to make it quick, easy, and free for schools to identify employers and people in work willing to support the career development of students. Moreover, the national Ministry of Education provides schools with extensive guidance on how to work successfully with employers (Careers.govt.nz[176]). As of June 2024, New Zealand's Education to Employment unit was under review as part of the Ministry of Education's restructuring efforts.

Such recent action is testament to systemic approaches aimed at broadening and deepening employer engagement across secondary provision as well as within Career Pathways. Nonetheless, employer engagement and responsiveness to economic and strategic needs remains a challenge across countries, particularly in the responsive development of new programmes to fields of rapidly growing employer demand, such as cyber security and green technologies.

7.2.2. Regional collaboration to expand options

Regionally, some districts have addressed limited access to work placements and tertiary level provision through collaborative working. In Texas's Rural School Innovation Zone, five small school districts partner to share and leverage resources, thereby offering expanded opportunities for students regardless of their home district. In British Columbia, the college and five school districts included in the South Island Partnership (SIP) co-operate to offer more dual enrolment courses at Camosun College and meaningful work-based learning experiences than they could provide on their own. Executive Director of the SIP, Nicola Priestley explained in an interview with the project team that there were multiple benefits and that the proximity of institutions made it feasible. Through coordinated, collaborative working, institutional costs are managed while student access is enhanced.

> *There are numerous benefits [from] working together. As a partnership, we're able to not only spread expenses across multiple partners, but also seat availability. One district isn't responsible for filling a cohort of 24 for a class, they instead will be responsible for five seats. By working together, this creates much more access and opportunity for larger projects. And as an aside, the opportunity for our districts to come together, see each other, and connect on a monthly basis benefits the school-based teams in many ways, not only in dual credit and career exploration, but the relationships they've been able to form. They're constantly talking and collaborating outside of SIP. That feeling of community and connection is pretty magical. (Interview February 2024)*

7.2.3. Parity of esteem and articulation with tertiary education

A common challenge within new Career Pathways, as borne out by stakeholder surveys (Figure 3), is the poor reputation of vocationally related learning among many students, families and employers. In the five countries studied here, the challenge is being addressed by integrating Career Pathways into mainstream secondary education, allowing students to follow work-related interests without changing institutions or losing out on the opportunity to complete a general certificate of secondary education. Reputational issues relate to both the reasonable expectation that participation in a programme of study will lead to opportunities of desirable skilled employment or continuing education, and to perceptions of the capacity of provision to achieve such aims. Strategies applied through federal or state policy changes directly address parity of esteem and articulation concerns. In Scotland, Foundation Apprenticeships were not initially accepted by higher education institutions as equivalent to one of the five "Highers", or qualifications needed to pursue tertiary education, a disincentive for some students (and their parents). Over several years, Skills Development Scotland worked with the country's higher education institutions to secure agreement that FAs would be treated in the same way as Highers, helping to broaden the appeal of the programme. In Australia, the government of Victoria replaced the Victorian Certificate of Applied Learning (VCAL) with the VCE Vocational Major in 2023, aiming to elevate the esteem of vocational pathways. One alternative approach, pioneered by the state of Delaware, has been to require all students to engage in a Pathway programme.[10] This is the approach of many high schools, and currently seven out of ten high school students are so enrolled.

The provision of greater career guidance moreover has also been seen to address parity issues by providing students with a deeper understanding of how different forms of secondary learning can enhance opportunities later in life. As illustrated below in the quotation from a Scottish student, greater engagement can follow expanded student capacity to understand the opportunities presented by Career Pathways within individualised conceptions of career progression.

> *"I chose the Children and Young People Foundation Apprenticeship because I thought it would be really useful when it came to family law because I knew that a lot of what it would entail would be dealing with children from different backgrounds and vulnerable children…So, I thought this [FA] would give me that information. But most importantly, I took it because it was new. So, I knew that so many people applying to uni wouldn't have that on their qualifications in their CV, so it would really make me stand out… to get two Highers without doing an exam really appealed to me."*
>
> *— Abbie Johnson, a law student who took a Foundation Apprenticeship in "Children and Young People"]*

The close engagement of higher education institutions, and the availability of tertiary credit or dual enrolment, has also been leveraged to enhance the attractiveness of provision. As the Scottish example illustrates, jurisdiction level interventions have the benefit of facilitating such articulation between education levels. As one professor at Robert Gordon University shared, *"The goal of our system is 'no wrong doors"*. (June

[10] In Delaware, as of the class of 2011, a "pathway" as defined as "a planned programme of at least three [courses] in sequence or specialized courses designed to develop knowledge and skills in a particular career or academic area" are a graduation requirement (Delaware Graduation Requirements, Regulation 505).

2023) The intent behind this statement is that a student should be able to easily move from one pathway to another. For example, if a student were to start on an engineering pathway and decide to move into a Modern Apprenticeship as an electrician, or vice versa, the system should be malleable enough to efficiently respond to her aspirations.

7.2.4. Enabling student agency to strengthen programme participation and effectiveness

For Career Pathways programmes seeking to expand provision to large portions of students in traditional secondary education, a potential implementation challenge is making the programmes attractive to students in the first place. Though this concern was less frequently cited than others among the policymakers and practitioners surveyed for this project, over one-third of respondents (36%) considered it a weakness in their programme (Figure 3). The efforts described above to ensure fruitful employer engagement, expand options for students, and achieve parity in credentials and reputation are all designed to make Career Pathways programmes more attractive to students. An equally important design feature of the programmes studied in this paper was to strengthen students' control over their learning and career paths.

Recognition that a lack of agency left many students demotivated in school was a key motivation for expansion and innovation in career pathways (Section 5.1) and a recurring theme in interviews with students, policymakers, and practitioners. Curricula as typically designed in schools were described as rigid and largely disconnected from the "real world", and secondary school was therefore seen as something done to students rather than a relevant experience co-constructed by students. A student in a healthcare pathway in British Columbia described it this way: *"I find in high school, they give it to you, you do it, they tell you how you did, you move on. In my internship, everything's new and I have to figure it out. I learned more in three months than I did in three years in School."* The concept of student agency, as understood in the context of the OECD Learning Compass 2030, is "rooted in the principle that students have the ability and the will to positively influence their own lives and the world around them. [It is] defined as the capacity to set a goal, reflect and act responsibly to effect change. It is about acting rather than being acted upon; shaping rather than being shaped; and making responsible decisions and choices rather than accepting those determined by others" (OECD, 2019[177]).

The Career Pathways programmes profiled in this paper seek to help students connect their passions and interests to meaningful and relevant career learning within secondary education. In Auckland's Manurewa High School, students can explore a maker space or engage in a broad range of career experiences, from running a garden-to-table school canteen to receiving training as an entry-level IT specialist. In Delaware, while many students choose pathway courses that relate closely to their career interest, others use the hands-on experience to round out their practical knowledge or skills. For example, one student shared with the project team that they engaged in an agriscience pathway not to pursue farming, but to provide a foundation for planned exploration of global warming at university, and another shared that they participated in a hospitality pathway in a beach resort not as a first step towards a career in hotel management but as a way of improving their 'people skills' before entering a pre-med programme (Delaware student interviews, October 2023).

New Brunswick, Canada's Essential Skills Achievement Pathway (ESAP) gives student's significant agency over when, how, and what they learn. To enable students to take ownership over their learning, ESAP provides fluid completion timelines "that allow students an enormous amount of choice for people to be focused on their career

development as opposed to just high school completion".[11] Students learn their core foundational skills, but they have a great deal of autonomy to explore their interests in self--driven projects and internships. As one ESAP student shared with the project team: *"I think it's a great process because everyone else my age that isn't in Essential Skills, doesn't know what they're looking for at all. I know what I'm doing. I know where I'm going. I know the next step."* (February 2024) An ESAP teacher reinforced the benefits of giving students more autonomy over their learning journey: *"Students that had behaviour problems in the past all of a sudden weren't having as many, or attendance issues, or just attitude issues towards education in general. Students come walking in the door every morning looking forward to doing projects and working with their peers, as opposed to just getting through the day"* (February 2024).

7.3. Ensuring equitable access

Equitable access relates to the availability of Career Pathway programmes that may be constrained by geographic location, but also to the capacity of programmes to address structural inequalities, for example in relation to barriers which might hinder the progression of social groups sharing distinct characteristics from fairly progressing towards desirable careers (OECD, 2024[89]). Across the five countries, several strategies are being employed to address these challenges.

7.3.1. Intentional and timely career guidance

In many schools, Career Pathways represent a new way of learning. For students and their advisers, decisions are required as to whether they will take up the new offer or focus on traditional provision. For students, decision-making relates not just to the attractiveness of subject content, but also to perceptions of opportunity costs from pursuing Pathway options. It is the role of guidance systems to help students make decisions which are right for them personally. Consequently, jurisdictions introducing new Career Pathways tend also to place high focus on enhancing the quality of career guidance particularly at lower secondary and primary level, the years prior to Career Pathways being available. For instance, the state of Victoria (Australia) provides funding to government schools for all Year 9 students (age 14–15) to participate in a diagnostic self-assessment of their aptitudes and interests, which a trained guidance counsellor then reviews with each student as they undertake career action planning, consider work-based learning opportunities, and choose their subject selections for upper secondary school and beyond.

In Scotland, Skills Development Scotland is responsible for career guidance delivered in all 350 of its secondary schools. It aims to work with schools, colleges, universities, trade unions, and local level authorities to deliver a consistent set of information and support to anyone in the country on the latest Labor Market Information. Further, there are 21 industry-led Developing the Young Workforce teams located across the country, to help facilitate connections among young people, their schools, employers and regional training providers. On its web portal, students and adults can find a mix of in-person and online supports.[12] Two web sites are geared toward young people making career transitions from upper secondary school: myworldofwork.co.uk and apprenticeships.scot. In My World of Work, a student can explore careers, carry out self-assessments of their

[11] Interview with ESAP Learning Specialist Beth Henderson, February 2024.

[12] https://www.skillsdevelopmentscotland.co.uk/what-we-do/scotlands-careers-services/our-careers-service-in-schools/

strengths, skills, and interests; find out where they could get targeted training for their job of interest; and connect directly to job openings.

Some jurisdictions are also starting the career navigation process prior to secondary school. In the US, as of 2018, federal Perkins funding can be used for students in grades 5–8 (ages 11–14) (Advance CTE[178]). In Delaware, over 35 000 of these middle school students participate in CTE courses.[13] In 2023, the state expanded these programmes to include more practical experiences with the aim of helping students to better understand their interests and prepare for high school (Delaware Pathways[156]). In Canada, both British Columbia (Government of British Columbia, 2023[141]) and New Brunswick (New Brunswick Dept. of Education[179]) start career readiness curricula in primary grades, with broad and age-appropriate instruction.

7.3.2. Personalised solutions to ensure access to work-based learning opportunities

While several initiatives described above expanded potential options for career-connected learning, distance and barriers to travel impede many learners from accessing those opportunities. This was the leading concern among practitioners and stakeholders surveyed for this study, with over half of respondents expressing moderate or strong need for improvement in this area (Figure 3). The programmes visited by the study team addressed this challenge through a variety of solutions tailored to the circumstances of their students and locations. For example, schools in Texas established flexible timetables by making use of A and B days, where A days are structured into traditional 90-minute courses and B days are more flexible for projects and work-based learning. Consistency in timetabling across a school district or region opens the way to students moving between high schools to follow Career Pathways not offered in their home school. In Texas, students regularly leave their home high school at 6.15 am to arrive at the campus of a partner school at 8 am. Students complete a morning of study at the partner school, returning to their home school at lunchtime. Personalised approaches to supporting student access to work-based opportunities also include provision of driving lessons to students with access to a vehicle, as has been the case with Manuwera School in New Zealand since 2018.[14]

Other programmes eliminated distance as a limitation by bringing opportunities close to home. Massey High School, a New Zealand secondary school visited by the study team (not one of the eight core cases), engaged students in building homes from the ground up for families in the surrounding community (OECD[180]). Through construction, plumbing and electrical installation, the predominantly Maori and Pacific Islander students learned work-relevant skills. Such provision was seen as a means of increasing student engagement in schooling.[15] Across multiple study sites, technology was being leveraged for virtual practical learning, simulating workplace experiences using virtual and augmented reality. Educators shared or demonstrated how students were learning how to drive a snow plough on a simulator, designing buildings in an engineering course or performing virtual autopsies in a healthcare pathway. As digital technologies develop, opportunities can be expected to

[13] Data provided by Career and Technical Education Unit, Delaware Department of Education (June 2024).

[14] MHS Trades Academy Director Steve Perks, "Manurewa High School Driving Lessons" (RTT Global 2018).

[15] Massey High School in Auckland, New Zealand. Construction program visited in May 2023. For additional details, see New Zealand Homes and Communities July 2020 press release, "High school students building new Kāinga Ora homes".

grow in relation to e-learning and career development. In New Brunswick for example, students use virtual reality headsets to experience working environments that use heavy industrial equipment; and in Finland and the UK, students now can undertake work placements virtually (OECD, 2023[181]; [182]; [183]).

7.3.3. Intentional design and measurement to strengthen equity

All programmes and partnerships highlighted in this study ultimately aim to address inequalities in education and the workforce—mainly by providing quality opportunities to all students, including—or especially—learners at risk of struggling in high school or beyond. Some achieve these goals by virtue of the population they serve: RSIZ in Texas serves learners in mostly rural and low-income communities; Manurewa High School does the same for socially disadvantaged groups in South Auckland. Others design programmes intentionally to serve learners inclusively. For instance, to ensure that students with additional learning needs are engaged, the South Island Partnership has a Pathways for Life Learning and Work that provides students with the technical and life skills to gain entry-level employment (Box 3). The Westlake Girls STEAM programme in New Zealand is building integrated, multi-year experiences into provision with the aim of facilitating the progression of female students in STEM post-secondary education and careers. In Australia, the Girls Can Too programme enables female students to explore traditionally male-dominated fields (Box 2).

Most jurisdictions are in the process of developing means of measuring outcomes, including in relation to equity, by building longitudinal data systems. Delaware Pathways provides a nascent example. There, detailed data revealed that, though participation in Pathways across subgroups was largely proportional to student population in 2020–2021, completion rates were disproportionally low for low-income students, students with disabilities, and multilingual learners and particularly pronounced among male students, suggesting insufficient supports provided to these subgroups (Bellwether, 2023[152]). Such variation in outcomes was a significant motivation for a pilot programme to expand career guidance and exploration to younger learners (ages 11–14), a move expected to help socially disadvantaged students the most (Bellwether, 2023[152]). Students interviewed in the design of the "Rethinking Middle Grades" pilot in Delaware explained that they were unclear as to which high school would be a good choice for them, let alone the courses they might need to take in order to pursue their career of choice. The logic behind the middle grades pilot across 10 schools (5 500 students) is to improve student agency and understanding of their options by

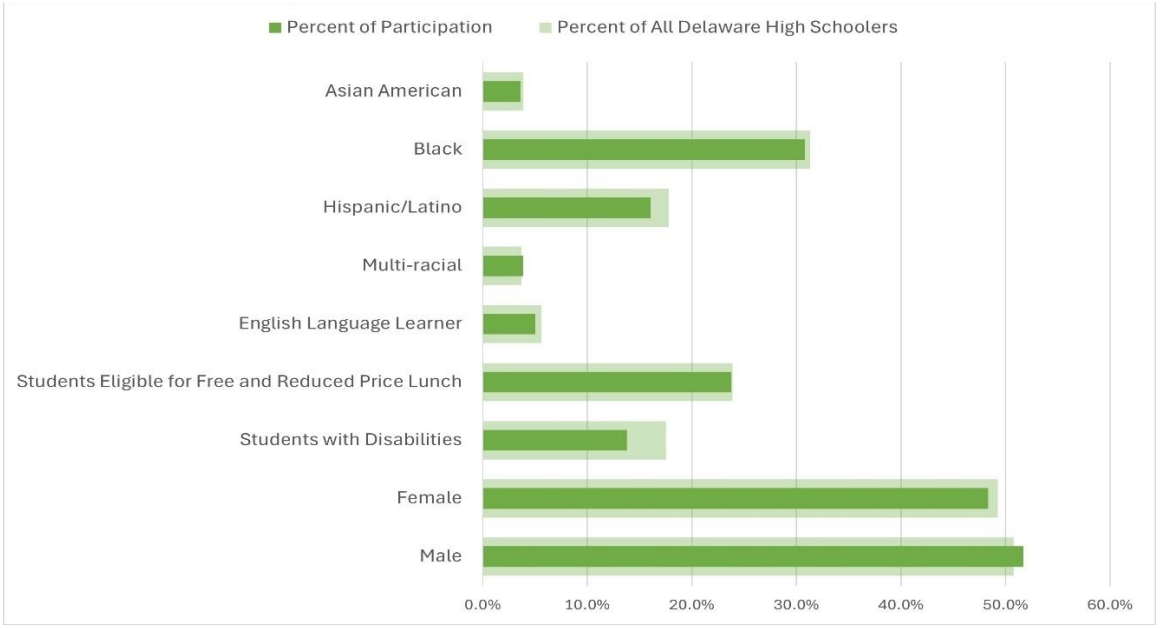
a) building, through student-centred design, an understanding of who they are;

b) expanding their understanding of the range of career options available to them through role plays and job shadowing; and

c) building an actionable high school-ready plan that aligns to their interests (Delaware Pathways[156]).

Figure 5. Delaware Pathways Participation 2020-21

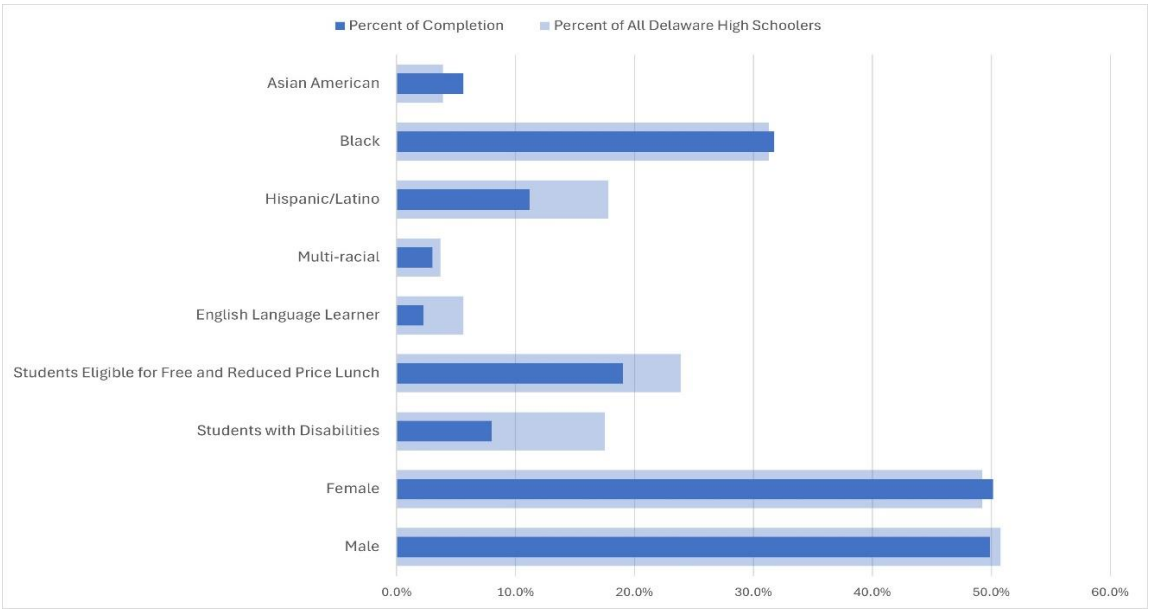
Upper-secondary public school student characteristics



Source: Delaware Dept. of Education Technology & Data Office, June 2024

Figure 6. Delaware Pathways Completion 2020-21

Upper-secondary public school student characteristics



Source: Delaware Dept. of Education Technology & Data Office, June 2024

Despite growing efforts to address inequity in its different forms, Delaware data highlights continuing challenges in ensuring equitable outcomes for the full range of students.

Box 3. Pathways for Life, Learning and Work in British Columbia, Canada

The objective of the programme is to prepare students facing additional educational barriers to secure entry-level employment after the completion of secondary school. The programme combines practical and theoretical provision over four days per week for six weeks for which students receive college certification. On completion, students typically seek to secure positions in customer service, food service or horticulture. They can build on the programme through Camosun's Employment Training & Preparation course that provides them with additional work experience, a college certification, and a range of life skills.

Source: Camosun College

8. Conclusion

> *The refrain in Australia is all about jobs and skills. We are committed to building a workforce that's going to be adequate to our needs in an AI world. [But] this is not just about jobs and work, it also means thriving as humans.*
>
> *I believe that there is a particular understanding at the moment that we have this false separation between head and hand. That we need to integrate all of this learning in a way that helps young people think about their futures, to think about their own agency. To not be distracted by narrow definitions of success, but to think about the kind of work and life they will value for their own well-being.*
>
> *And that's what we're seeing. We are seeing an understanding that we need to shift the way in which we do upper secondary education. We need to open up multiple pathways for young people that will match their passions… and give them a real sense of direction where they can make the kind of contribution they want to make. Not just about caring for themselves but caring for others and caring for the planet* (recorded Interview, Anthony Mackay, Deputy Chancellor, Swinburne University [Melbourne, Australia] and Co-Chair of the National Centre for Education and the Economy, June 2023*)*

Over many years, Career Pathways have provided students with an alternative to upper secondary education provision that is either purely academic or vocational in content. Career Pathways offer students the opportunity to integrate provision in ways designed to enable deep career exploration and significant career preparation in relation to vocational sectors, while keeping their options for the future open by completing general qualifications of upper secondary education. Such programmes have been in existence for more than half a century, but over the last fifteen years they have been adopted in new forms by countries and educational institutions. Most significantly, educational jurisdictions are moving from a situation where Pathways formed isolated, experimental examples of practice to provision which is increasingly coordinated and integrated across general provision within strategic plans for long-term workforce development and educational transformation. While evaluations of such new Career Pathways are limited, longitudinal studies of historic Pathway provision and associated forms of teenage career development provide considerable confidence that such a model of provision can be expected to improve employment outcomes for young people (Covacevich et al., 2021[3]).

Innovative practice in Australia, Canada, New Zealand, Scotland, and the United States provide a test-bed for understanding the motivations behind and challenges encountered in designing and delivering the new Career Pathways. For countries considering such development, lessons emerge.

8.1. Understand the case for reform with students at the centre

Motivations for the development of Career Pathways relate to concern over the effectiveness of the educational offer as it relates to the growing diversity of student populations across jurisdictions, the need for provision to keep up with the pace of economic change and the desire to increase young people's chances of securing good employment and pursuing fulfilling lives. Consequently, policy development sits at the nexus of discrete policy areas: education, workforce development, youth employment, strategic economic growth, and social equity. Increasingly, these efforts to rethink career

development within secondary education begin with students at the centre of the design process. In some of the countries discussed here, policy development has followed the establishment of independent, expert commissions designed to explore long-standing educational challenges in light of international practice. In some cases, this has meant fundamentally redefining what it means to be an educated citizen (Province of British Columbia, 2023[184]).[16]

8.2. Develop a shared vision for better career development

To be effective, policy development will ensure that new provision will be attractive to the key stakeholders whose interest and engagement is essential to successful implementation. For young people and their parents, new provision must offer something different in terms of teaching and learning, but also provide confidence that any investment of time and energy can significantly enhance the prospect of ultimately obtaining desirable progression into the post-secondary education, training and/or work. For schools, new provision must be deliverable and appropriately resourced, including access to appropriate teaching professionals and equipment. For employers, for engagement to be warranted in terms of expected reductions in recruitment costs and improvements in the flow of talent into an industry, provision must be sufficiently linked to actual demands of employment within a sector. For government ministries, expectations will be clear that long-term benefits in educational success, reduced social costs, greater productivity and economic growth, notably in fields of strategic importance, will exceed additional costs encountered in the initiation and delivery of new Pathways. Hence the importance of integrating robust means of data gathering. Effective provision will ensure that the cost-benefit analysis works for all key stakeholders.

8.3. Build in the time and capacity to deliver at scale

To optimise the likely long-term success of new visions for secondary education, Career Pathways initiatives can benefit considerably from actively engaging the full range of stakeholders from secondary and tertiary education, the employer community (including professional bodies), as well as parents, students and the broader community, in programme development and delivery. Such engagement requires investment of time and resources. Pilot initiatives may productively begin in areas where recruitment is more challenging for tertiary institutions and employers, such as STEM. Fully engaging employers and tertiary education institutions in the design of programmes from the outset (versus reviewing plans that are largely complete) optimises the likelihood of engagement in delivery while providing students (and their advisers) with confidence about outcomes which can be expected from successful participation. While targeted philanthropic investments may be helpful in catalysing new ideas, scalable and sustainable solutions require meaningful changes in public policies and investments.

[16] The BC Ministry of Education engaged in a collaborative, province-wide process to help shape their current version of "an educated citizen". For resources and information on the curriculum redesign, see: https://curriculum.gov.bc.ca/rethinking-curriculum. This process was catalyzed by a piece of legislation from 1989 that calls for a new definition of an "educated citizen", (2023[184]).

8.4. Make it easy for key stakeholders to engage in delivery

Infrastructural support at a jurisdiction-wide level serves to enhance levels of engagement by identifying and connecting with employers, professional bodies and people in work well placed to support the delivery of Career Pathways. Intermediary organisations working through traditional modes of engagement and through digital systems exist to help stakeholders engage and communicate more efficiently. Additional support can also facilitate school engagement through coordinated timetabling, student travel arrangements and provision of appropriately trained teaching staff and learning resources. External teams can moreover provide efficient support to aid the delivery of high-quality work placements and provide advice and guidance to stakeholders, including students and their families. Central to moving from patchwork pilots to sustainable solutions is the political leadership to build the needed policy infrastructure and funding.

8.5. Challenge reputational doubts by ensuring key stakeholder awareness and understanding

The introduction of Career Pathway programmes offers a new approach to teaching, learning, and completion of upper secondary provision. Linked as they are to vocational education and the enhancement of progression from schooling into employment, reputational issues can be expected to influence the perceptions of key stakeholders. Engagement in a Career Pathway should be an active choice based upon the career exploration and research undertaken by students and their advisers, notably parents. Beginning guidance activities early, in primary or lower secondary provision, provides opportunity for students to investigate the potential merits of different pathways as they relate to their emerging interests and capabilities. Clear and trusted communication is essential to ensuring that students and their parents (as well as other stakeholders) feel well placed to make informed decisions. Such a process demands persistence.

8.6. Create data systems to understand patterns of engagement and outcomes

Motivations behind the introduction of Career Pathways commonly relate to desires to enrich learning and school engagement for a broader range of students, to ensure that knowledge and skill development align better with changing workforce needs and to better prepare students to succeed in competitions for employment linked to strategically important fields of employment. It is also a common intention that Pathways will be found relevant by a broad range of students, including students with characteristics which are underrepresented within related occupational areas. Monitoring and evaluation of data and stakeholder experiences will enable understanding of how successful new provision is in meeting policy objectives and identifying barriers to success within complex delivery systems. Moreover, better understanding of the long-term return on investment provides the foundation for rethinking the resourcing of secondary education, so addressing the higher costs typically related to Career Pathway provision. Such analysis will also help determine effective break-even points in terms of student engagement within new provision.

In this regard, considerable opportunities exist to introduce and better leverage longitudinal datasets which follow young people from secondary education into employment. As noted above, OECD analysis (Covacevich et al., 2021[3]) of such datasets reveals consistently strong patterns of better employment outcomes for young people linked both to participation in earlier forms of Career Pathways and the types of career development, notably engaging employers, which characterised their delivery. Improved data on student

outcomes enables a fuller understanding of the individual, economic and societal returns that can be expected from additional investment in secondary education. Return on Investment analyses (Percy and Hooley, 2023[185]) explore economic outcomes in terms of higher tax takings and lower welfare costs to jurisdictions. Longitudinal analysis through cohort studies also has capacity to explore the equitability of outcomes linked to educational reform as well as impacts on the psychological well-being of participating students in contrast to control groups.

8.7. Build or expand learning networks

Most of the initiatives described above are relatively new and small. In some countries effective learning networks exist across jurisdictions. Redesigning well-established systems is a complex undertaking. While each jurisdiction is exploring distinctive approaches based on particular historic and political contexts, the study team found a strong interest among participants in this paper in learning from their international peers. Expanding such networks can be expected to advance opportunities for practitioners and policymakers to learn with and from one another within a culture of transparent evaluation.

Annex A

Table 10. Longitudinal studies exploring the impact of teenage career pathway participation on adult employment outcomes

Country and author	Dataset	Programme	Outcome
Australia, Misko et al. (2020[186])	Longitudinal Surveys of Australian Youth	VfSSS (VET for Secondary School Students)	Lower NEET rates
Canada, Covacevich et al. (2021[3])	Youth in Transition Survey	'a school course with employer engagement'	Lower NEET rates Higher earnings
USA, Griffith (2001[187])	Two US school districts	Career and Technical Education	Higher employment rates Higher earnings
USA. Kemple (2001[188])	Randomised Control Trial	Career Academies	No impact on initial transitions
USA. Bragg et al. (2002[189])	Longitudinal student surveys	Tech Prep	No impact on initial transitions into employment
USA, Bishop & Mane (2003[190])	National Education Longitudinal Study	Career and Technical Education	Higher earnings
USA. Neumark (2004[79])	National Longitudinal Study of Youth 1997	School-to-career programmes: co-operative education, internships/apprenticeships, Tech Prep	Higher rates of employment associated with co-operative education, internships/apprenticeships and to a lesser extent with Tech Prep programmes
USA. Neumark & Rothstein (2005[78])	National Longitudinal Study of Youth 1997	School-to-career programmes for low SES students: co-operative education, internships/apprenticeships, Tech Prep	Higher rates of employment for low SES students associated co-operative education, internships/apprenticeships and to a lesser extent with Tech Prep programmes
USA, Kemple (2008[36])	Randomised Control Trial	Career Academies	Higher Earnings
USA, Page (2012[191])	Randomised Control Trial	Career Academics	Higher Earnings
USA. Shandra & Hogan (2008[82])	National Longitudinal Study of Youth 1997	School-to-work programmes for students with disabilities: co-operative education; Tech Prep	Higher rates of employment and earnings: co-operative education. Higher rates of employment: Tech Prep
USA. Fletcher & Zirkle (2009[192])	National Longitudinal Study of Youth, 1997	Career and Technical Education	Higher earnings
USA, Dalton et al. (2013[193])	High School and Beyond	Career and Technical Education	Higher employment rates
USA, Dalton et al. (2013[193])	National Education Longitudinal Study	Career and Technical Education	Higher employment rates
USA, Dalton et al. (2013[193])	Education Longitudinal Study	Career and Technical Education	Higher employment rates
USA. Nicholas et al. (2015[194])	Educational Longitudinal Study, 2002-2012	co-operative education	No impact on earning
USA. Dougherty (2016[29])	Arkansas States Longitudinal Data. 2008	Career and Technical Education	Higher rates of employment Higher earnings
USA. Hollenbeck & Huang (2016[195])	Washington State Longitudinal Data, 2011	Career and Technical Education	Higher rates of employment Higher earnings
USA. Kreisman & Stange (2020[30])	National Longitudinal Study of Youth 1997.	Career and Technical Education.	Higher earnings.
USA, Enayati & Karpur (2018[81])	National Longitudinal Study of Adolescent to Adult Health	School-to-work programmes (low-income students with disabilities)	Higher rates of employment Lower wages
USA. Covacevich et al. (2021[3])	Educational Longitudinal Study, 2002	co-operative education	Greater job satisfaction
USA, Carruthers et al. (2022[80])	State administrative datasets, Massachusetts, Tennessee, Washington.	Career and Technical Education – students with disabilities	Higher employment rates
USA, Ecton & Doughterty (2022[85])	Massachusetts state longitudinal system	Career and Technical Education	Higher earnings

Annex B

Supplementary information on policy documents influencing career pathways innovation

Table 6 provided qualitative summary indicators of the relative importance of different policy motivations for Career Pathways innovation based on a review of 24 documents from five countries that either stated government policy (frameworks, strategies, rationales, plans) or are government-commissioned independent reviews that were subsequently endorsed or adopted by policymakers. Most documents were identified by the practitioners and policymakers interviewed for this study as highly influential either to Career Pathways innovation in general or to the specific programmes highlighted in this paper. The remainder were identified by the study team based on relevant legislation and the websites of the government agencies responsible for setting Career Pathways-related policy.

The indicators of strength of motivation used in Table 6 are based on the share of documents that mentioned the motivations in question. Underlying frequencies are presented below in Table 11. Each row shows how many documents per country mentioned each broad and specific policy objective (regardless of how many times the objective was mentioned within the document), and the last row shows that total number of documents reviewed per country. An objective is assessed to be "minor" (+) when it is mentioned in one-third or less of the reviewed documents, "medium" (++) when it is mentioned in up to two-thirds of documents, and "major" (+++) when it is mentioned in over two-thirds of documents.

Table 11. Frequency of policy motivations influencing career pathways innovation across five countries, 2011–2024

Motivation/ Objective	USA	CAN[2]	SCOT[3]	AUS	NZ
Improve the schooling experience	**2**	**3**	**1**	**3**	**1**
Engaging and relevant schooling experience	1		1	2	1
Quality schooling enjoyed equitably	1	3	1	3	1
Better prepare students for post-secondary life	**4**	**6**	**4**	**5**	**4**
Students making informed choices for post-secondary life		2	1	4	2
Students prepared for evolving economy/technology/world	4	6	4	5	2
Post-secondary opportunities available equitably	2	2	1	2	1
Address the needs of the economy and society	**4**	**4**	**4**	**2**	**4**
Current and expected talent/skills needs met	4	4	3	2	4
Low rates of youth unemployment and NEET[1]	1		1	2	1
Total number of influential policy documents reviewed	*4*	*6*	*4*	*5*	*5*

Note: 1. NEET = Not in education, employment, or training. Notes: Strength indicators (none, minor +, medium ++, strong +++) for the three broad motivations are determined by comparing the number of influential policy documents in the country that cite each area of concern with the total number of influential policy documents reviewed for that country.
2. Three documents each were reviewed for the Canadian provinces of British Columbia and New Brunswick (motivations are distributed similarly across the two).
3. Scotland documents include the Hayward Review (2023[196]), the recommendations from which the government had not endorsed or committed to implementing as of May 2024. However, Skills Development Scotland leadership interviewed by the study team considered the review to be influential and an endorsement of the approach to education and career-readiness that motivated Scotland's Foundation Apprenticeships programme.
Source:

- United States: (Loyd, 2022[99]; Markell, 2015[197]; Symonds, Schwartz and Ferguson, 2011[96]; U.S. Dept. of Education, 2022[198])
- Canada: (Ministry of Education and Child Care, 2023[117]; Government of British Columbia, 2023[109]; 2018[98]; New Brunswick Dept. of Education and Early Childhood Development, 2022[106]; 2021[100]; [199])
- Scotland: (Hayward, 2023[196]; Scottish Government, 2020[200]; Skills Development Scotland, 2022[111]; Wood, 2014[103])
- Australia: (Australia Education Council, 2014[201]; Firth, 2020[97]; Macklin, 2020[202]; Noonan, 2019[203]; Shergold, 2020[102])
- New Zealand: (New Zealand Ministry of Education, 2019[204]; 2018[101]; New Zealand Ministry of Social Development and Ministry of Education, 2020[205]; New Zealand Tertiary Education Commission, 2022[107])

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