

Global Lessons: Career Pathways in a Rapidly Changing World



Paul Herdman (2025)

Acknowledgements.

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Executive Summary

The challenge

While there are more jobs than job seekers in the US, navigating the job market is not easy. Facing unprecedented global challenges, young people are managing high degrees of stress. And while today's young people tend to be better educated, they often have less practical experience, which can delay the beginning of their careers. Compounding this challenge are shifts in automation and digitization and the need for rapidly evolving skill development.

Focus

The project looks at how five countries are approaching the development of "career pathways" which blend traditional general education, primarily at the high school level, with experiences that ground young people in a career such as work-based learning, and gaining college credits or industry credentials while still in secondary school. This approach has taken on new forms in the last decade and is gaining traction in the five countries studied.

Study overview

This monograph relies heavily on the larger OECD working paper by Herdman et al. (2024) as well as associated blog posts and podcast episodes. From spring 2023 to summer 2024, the author worked with teams at Rodel and the Organization for Economic Cooperation and Development (OECD) to learn more about the efforts to improve school-to-work transitions. The teams reviewed literature and engaged with over 500 policymakers, practitioners, and students in Australia, Canada, New Zealand, Scotland, and the US. What follows is a distillation of that research and 10 lessons learned on the design and implementation of that school to work transition.

What we know

This is not a new idea. The concept of connecting students to meaningful work-based learning experiences has existed for well over a century in the United States. However, many of these efforts have been targeted to the skilled trades and limited to students deemed unlikely to succeed in, or uninterested in pursuing, postsecondary education.

Career pathways offer a different approach. Following the global economic crisis (2007-2009), policymakers in the five countries studied saw a spike in youth unemployment and explored international best

practices. In the US, there was a recognition that, while most “good jobs” would require at least some education and training beyond high school, there was growing misalignment between what was being taught, what students found engaging, and what employers needed. Recent shifts in career pathways are more systemic in that they are designed to prepare young people for the skilled trades as well as a broad range of high-growth careers, including those requiring postsecondary education. In short, recent shifts in career pathways involve moving from some students to *all* students, and from college or career, to college *and* career.

Career connected learning improves education and employment outcomes. A growing body of research suggests that career readiness activities in high school are helpful to adults later in their lives. In particular, a recent OECD study of 10 countries over a decade of longitudinal data (Covacevich et al., 2021; OECD Career Connected Learning) has shown that students who engaged in a range of career readiness activities at age 15—from job fairs to paid internships—had better employment, education, and wage outcomes than comparable peers by age 25.

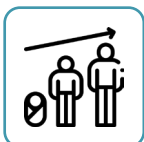
Countries approach career readiness along a continuum. From “general education” countries like the US and the four Commonwealth countries of focus, which rely on young people attaining a broad education until 16–18 years of age before making career choices, to “apprenticeship countries,” like Switzerland and Germany, where the majority of students enter an apprenticeship at about age 14—countries prepare their young people for lives and careers after secondary school along a continuum of approaches.

There is movement toward integrating the “head and the hand.” Each of the five countries in this study were evolving to incorporate more real-life, career-related experiences into their classrooms. While none expressed interest in relying as heavily on apprenticeships as the “apprenticeship countries,” policymakers and practitioners in all five countries appear to be shifting their position on that continuum toward a more blended approach where work-based learning and apprenticeships are more common.

10 lessons learned

These lessons are organized around the design and implementation of career pathways.

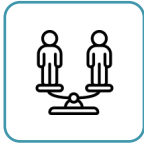
Design



1. Start earlier Young people need more time to explore “who” they want to be and develop the durable skills needed to thrive in life and work. British Columbia, Canada, has updated its definition of an “educated citizen” to include career readiness.



2. Build around student agency Students want more ownership of what, when, where, and how they learn. New Brunswick, Canada, is building out a district-wide approach that enables students to build high school experiences around their unique career interests.



3. Design for “no wrong doors” Regardless of where a student is in their career pathway, there should be a “next step.” Whether they are in an apprenticeship, higher education, or a career, they should be able to move back and forth seamlessly. This is evident in Scotland’s mix of apprenticeships from high school to higher education.



4. Maximize access In many regions, limited transportation and employers are challenges to students trying to access career pathways. To expand their reach and impact, educators are leveraging virtual reality from Auckland to Delaware, and some are working regionally to increase access and impact.



5. Focus on equity Without intentionality about universal design, policymakers will fall short of our collective vision of career pathways as a means to social mobility. Practitioners from New Zealand to Canada are beginning to address disparities in gender, income, and neurodiversity, but this remains an ongoing challenge.

Implementation



6. Put forward a compelling, common, vision Rethinking how students move from school to careers requires complex changes in multiple, often “siloe” systems across education and the workforce. From Australia to the US, policymakers and practitioners have dedicated resources to research best practices and engage stakeholders to build a shared road map and vision.



7. Invest in change management Scaling career pathways requires practitioners and parents to fundamentally rethink how their schools operate and for employers and higher education partners to adapt in new ways. From Australia to the US, public and private sector partners are dedicating the resources and time they need to help them navigate these changes.



8. Co-design with employers Unless employers see career pathways as more than good corporate citizenship, they will not grow and be sustained. From Edinburgh to El Paso, policymakers are targeting high-growth industries and co-designing pathways with employers. There’s often a misalignment between what employers need and what students are learning in school. To address these gaps, new government and nonprofit entities, like “industry councils” are being developed.



9. Build the blur In 2021, Jobs for the Future put forward “[The Big Blur](#),” an argument for erasing the boundaries between high school, college, and careers, and creating one new system that works for everyone. Districts and states around the country are working toward this vision. To implement quickly and at scale, policymakers can expand or strengthen existing programs that blur the existing lines rather than starting from scratch.



10. Move from pilots to policy Because of the policy and infrastructure barriers that exist among high schools, colleges and employers, most of the efforts to grow career pathways are small. From Scotland to the US, policymakers are working to build the long-term public sector policies and investments to scale and sustain them. This requires building data systems, governance models, and funding policies that reflect the goals of the new approach.

Conclusion

Across the five “general education” countries studied—Australia, New Zealand, Canada, Scotland, and the US—there is a shift toward building more seamless connections to careers while students are still in school. Whether it’s expanding real-life experiences in work settings or building more opportunities to earn credentials and degrees, these evolving pathways are designed to help young people not only prepare for a meaningful career, but a meaningful life. This project is meant to contribute to the learning networks of employers and educators within the US and globally that are working to help young people contribute and thrive in this rapidly changing world.

Introduction

The Challenge

The US Chamber of Commerce shared in December 2024 that there are 8 million [job openings](#) in the US but only 6.8 million unemployed workers. With more jobs than people, this might suggest that navigating the US job market should be easy for young people. It's not. Instead, these numbers represent a talent gap in the economy and a skills gap among our young people, who are facing some unprecedented challenges.

The last decade has been especially difficult for young people to deal with. These digital natives have lived through global pandemics, the impacts of climate change, and political polarization. Not surprisingly, this is taking a toll. The Center for Disease Control [reported in 2023](#) that two in five high school students reported struggling with persistent feelings of sadness and hopelessness—and deaths from drugs, alcohol and suicide more than doubled between 2010 and 2017.

Against this backdrop, young people are entering a labor market in what the World Economic Forum calls the [Fourth Industrial Revolution](#), an economy that blurs the lines between the biological, physical, and digital realms. With [AI accelerating occupational shifts](#) in the economy, young people are often not sure what lasting skills they need to build. And they are not only facing a fast-moving economy—but entering life with more degrees yet less real-world experience and social connections than their adult peers did. As a result, they are taking longer to enter the labor market and have unemployment rates that are two to four times higher than their older peers ([Mann et al., 2020](#); [How Youth Explore, Experience](#)).

These gaps are not only problematic for the young people involved; they could put the US at a strategic disadvantage globally. In fields like artificial intelligence, quantum computing, semiconductors, and biotechnology, the gaps between the US and other industrialized countries, like China, are so large that leaders at Aspen Strategy Group and the Federation of American Scientists deem the gaps to be a [national security](#) risk. In short, we are facing challenges that impact our young people as individuals and as a nation.

Focus

This paper explores how the United States and four other countries—Australia, Canada, New Zealand, and Scotland—

What are career pathways in the US?

Career pathways typically start in high school and involve rigorous education and training aligned to student interests and the needs of the local or regional economy. Training tends to involve a combination of student advising, work-based learning, and access to postsecondary training inclusive of college, credentials, and apprenticeships.

For a full federal definition,

[click here](#)

For an overview of career pathways globally, please listen to the podcast by

Andreas Schleicher,

Director for Education and Skills, OECD.



are working to address these challenges by building what are known as “**career pathways**” in the US, [Foundation Apprenticeships](#) in Scotland, and [School-Based Apprenticeships and Traineeships](#) in Australia. While the models differ, all generally work to provide young people with meaningful work-based learning experiences aligned with high-demand industry sectors, and access to postsecondary training while in high school. These opportunities not only connect young people to career opportunities, but help them build the skills they'll need to thrive in life. This paper summarizes and expands upon an OECD [project](#) on career pathways that includes a working paper, Herdman et al. (2024), and a series of blogs and podcasts on the five countries studied.

Study Overview

This is the first international comparative study of career pathways. The project involved visiting 27 schools and interviewing 500 policymakers, practitioners, and students across five countries.

Interviewees engaged in this project. This table summarizes the 500 interviewees engaged for this project across the five countries visited.

Function/Role	Australia	Canada	New Zealand	Scotland	United States	Total
Policymakers (Government)	46	9	6	8	18	87
Practitioners (School & Higher Ed Admin/Educators)	40	24	18	14	36	132
Students	25	52	36	46	101	260
Other Partners (Employers & Non-Gov Partners)	4	0	1	6	10	21
Total	115	85	61	74	165	500

Source: Herdman et al. (2024), Table 2.

These interviews and site visits were bolstered by significant desk research by team members at the OECD and Rodel and surveys of more than 100 respondents.

What do we know?

This is not a new idea in the US. In the United States “co-ops,” or cooperative education programs that combine classroom-based education with (typically paid) practical work experience, have been around since the turn of the 20th century. While most prevalent in higher education, they were soon made available to high school students, primarily through vocational schools. Career and Technical Education (CTE) has been supported in our comprehensive schools in federal legislation since the Smith-Hughes Act of 1917. Common characteristics of CTE programs include a focus on a technical skill delivered alongside academic coursework and extensive use of work-related or work-based learning. Support for CTE continued through the last century through the Vocational Education Acts (1963 and 1968) and the Carl D. Perkins Vocational and Applied Technology Education Act of 1984 and its subsequent reauthorizations through 2018.

In the 1980s, Career Academies emerged as career-focused academies within American high schools, and

they demonstrated good results for targeted student populations (see [MDRC, 2015](#), and a more thorough review in [Herdman et al., 2024](#)) and well over a million students continue in them today.

In this same time period, “dual enrollment,” or the attainment of college credit while still in high school, was taking off. As Kelly Field ([Education Next, 2020](#)) writes, the research on dual enrollment suggests that students completing a college course while in high school helps with their completion rates in higher education, although the rigor of such courses is questionable. That said, this blending of work-based learning and college access appears to be more prevalent in the US than the other four countries I visited.

A blending of the Career Academies and dual enrollment could be found in the federally-supported CTE initiative called “Tech Prep.” This program, which began in the early 1980s, linked high schools with the first two years of college and helped lay the foundation for early college high schools and models like Pathways in Technology Early College High Schools (P-TECH), which emerged in NY in 2011. P-TECH combines high school with an associate degree and a meaningful work-based learning experience ([Atchison et al., 2019](#)).

These various iterations of CTE are in the DNA of the approaches we see today. These relatively small initiatives intended for target student populations are now expanding and informing the educational experiences of all students in several districts and states. CTE serves as an umbrella term for a range of initiatives designed to better align educational experiences with the needs of the labor market. At minimum, it encompasses programs of study that include at least two courses in a given sector, along with work-based learning experiences. Some version of CTE is now available in every corner of the US. In 2017, 98% of US school districts offered CTE programs in high school and 83% of those districts offered such programs within comprehensive, general education high schools ([NCES, 2018](#)).

Given the long history, why is there a renewed interest in career pathways in the last decade?

The renewed interest in career pathways is different for each country. Policymakers across the five countries shared a range of reasons why their states or countries were deepening their career pathways efforts in the last decade. Following the global economic crisis (2007–09), policymakers saw a spike in youth unemployment and began to explore what countries like Switzerland, which had low youth unemployment rates, were doing differently. (For example, before and after the Great Financial Crisis, youth unemployment in the US went from 11.5% to 19%, while in Switzerland, youth unemployment barely moved, only moving from 7% to 8%.) In the US, researchers at Georgetown University were projecting that 72% of “good jobs” would require at least some education and training beyond high school by 2031, so for some policymakers, career pathways were another, often more engaging way for young people to get the training and education they would need to be successful after high school.

In Canada, Angie Calleberg, Executive Director of Student Learning for British Columbia, saw the potential misalignment of what was being taught and what their students would need in the

Why are policymakers investing more in career pathways over the last decade? [See Here](#) for a deeper dive.

(Herdman et al., 2024)

evolving, global economy. She shared,

” *BC was already listed as a high-performing jurisdiction internationally, but while our kids were doing well right now...how well were we preparing them for a very unknown future, a future we couldn't quite imagine?*”

(Interview, February 2024)

The notion of adapting school curriculum to keep up with the future of work was echoed in Australia's [Shergold Review \(2020\)](#):

” *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.*”

Exploring and experiencing careers while in school helps in adulthood. Along with the recognition that career pathways could be helpful to all students and across all career options, there is growing evidence that the idea “works”—that career readiness experiences in high school can lead to long-term benefits into adulthood.

Research across multiple countries has shown that career development activities during high school, including career exploration, internships, and high-intensity CTE programs, can lead to improved academic and economic outcomes for students: higher rates of student engagement, on-time high school graduation, higher workforce earnings, and more frequent enrollment in higher education ([Covacevich et al., 2021](#); [Herdman et al., 2024](#)).

Why this works. The logic behind these findings is straightforward. When educators and employers help young people explore and experience the world they are about to enter—not only *what* they want to be, but

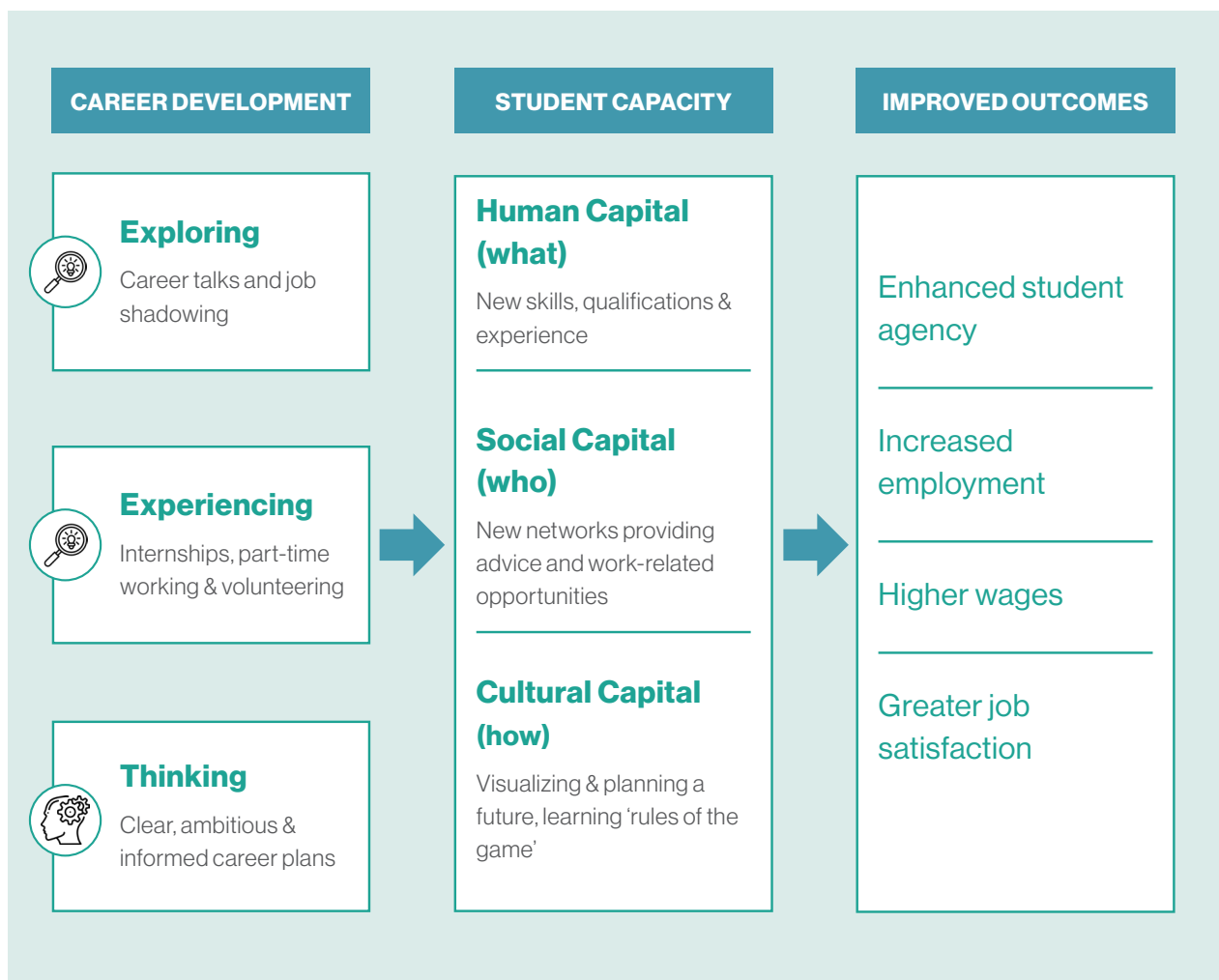
Angie Calleberg

Executive Director of Student Learning
for British Columbia

For more on Canada's approach,
listen to this podcast.



who they want to be—they begin to build three “capitals:” human capital (concrete skills), social capital (networks and mentors), and cultural capital (an understanding of how to navigate new situations). For a more developed explanation of “social capital,” see [Chetty et al., 2022](#).



Adapted from Herdman et al., 2024

Countries approach career readiness across a continuum.

Policymakers across the world build their public education systems to help young people for life after high school in ways that make sense for their context. These approaches fall along a continuum, with “general education” countries, like the US and the Commonwealth countries in this study, which have less than 25% of their students in vocational education and training (VET) programs, on the left, and “apprenticeship countries,” those with 50% or more of their students in VET programs, on the right.

Career pathways continuum. This figure summarizes each country’s approach to vocational education and training in upper secondary school, or high school. (The five countries in the Herdman et al., 2024 study are bolded.) The countries are organized based on the percentage of students, on average, that are participating in vocational education and training, from a “small” percentage (less than 25%) on the left, to “large” (50% or more) on the right.



Small (less than 25%)	Medium (25-49%)	Large (50% or more)
Australia, Canada, Ireland, New Zealand, United States , Korea, Lithuania, Brazil, Denmark, Iceland, Japan, Spain	United Kingdom, 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

Source: This table is adapted from OECD (2023), *Spotlight on Vocational Education and Training: Findings from Education at a Glance 2023*, OECD Publishing, Paris.

On one end, in “apprenticeship countries” (to the right in the figure above) like Germany and Switzerland, some 70% of students are making decisions about a career as early as age 14. In these nations, industry leaders, higher education, and K-12 officials have established some 300 pathways so that, when students are 18, most are ready to start their career in earnest. While students are engaged in significant work-based learning at a relatively young age, the “dual track” means that they are not locked in—they have the ability to change back and forth between academic and vocational pathways.

On the other end of the continuum, in what are known as the “general education” countries (to the left in the figure above), including the five countries in this study, students tend to make decisions about college or a career later in their lives, closer to 16–18 years old. Less than 25% pursue an apprenticeship (the US is lower than 20% and the UK is closer to 25%), and in the US about 62% of high school seniors go on to matriculate in a two- or four-year degree. (NCES, 2024)

In explaining “cultural competency,” **Glen Denham**, the first Māori headmaster of Wellington College in the school’s 150-year history, shared, “we want to teach our young people to be successful in the world. For our Māori and Pacific Islander boys, that might mean learning how to eat tea sandwiches. Like fish, we want them to be able to swim in any waters and not feel like impostors based on the color of their skin.”

[Listen to the full podcast here](#)



There is movement toward integrating the “head and the hand.”

Each of the countries in this study were evolving to incorporate more real-life, career-related experiences into their classrooms. While these five countries are not likely to have 70% of their students in apprenticeships anytime soon, there does appear to be a general shift toward the middle of the continuum—a greater blend between academic and work-based learning. Anthony Mackay, Deputy Chancellor, Swinburne University, in Melbourne, and Co-Chair, National Center on Education and Economy, framed it this way:

“*The refrain in Australia is 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... 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 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, for the planet.*”

(Interview, June 2023)



While there is much to admire about the apprenticeship model—and there is a growing desire to expand apprenticeships in the US—a wholesale shift toward becoming like Switzerland is unrealistic and perhaps undesirable. For one, in the US, only about 0.3% of the working-age population, or about 600,000 people, are in registered apprenticeship programs, while in Canada that percentage is five times higher, and in Switzerland, where they have over 230 well-developed apprenticeship models ranging from finance to the trades, that percentage is 12 times higher (McSwiggan, 2024).

Two, American parents would likely be hesitant to have their child commit to a career path at age 14. Some would, but not at scale. Related, parents might raise concerns about students being tightly grouped by occupation so early—for instance, future welders with only future welders or future healthcare professionals with only healthcare professionals. America’s diverse culture benefits from schools in which students representing different ethnic groups, learning styles, and perspectives can learn from each other.

And three, there’s also evidence of long-term benefits of the general versus apprenticeship approach. Hanushek et al. (2017) studied the life outcomes of those who went through vocational education versus general education across 11 countries and concluded that, though general education students tend to be slower to enter the labor market than those on a vocational path and earn less initially, they tend to catch up and often surpass their peers in terms of employment outcomes and lifetime income over the long term (by age 49 on average). Their research also questioned whether specializing earlier might prepare young people well for immediate entry into a sector, but might limit their ability to adapt as their job changes or goes away.

For a deeper exploration into eight case studies across these five countries, see pp. 35–63 of Herdman et al. (2024).

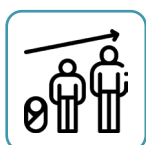
[click here](#)

10 Lessons Learned

Each of these five countries were exploring approaches that can inform how we support and educate young people across the country. The challenge for policymakers is how to rethink the infrastructure and policies needed to make these types of experiences available at scale; to break down the silos of traditional schooling, employment, and higher education so that young people can get off the conveyor belt of our traditional education system and co-design an educational experience that makes sense for them.

What follows are some lessons learned from five countries (Australia, Canada, New Zealand, Scotland, and the United States) on how to design and implement new approaches to transitioning from high school to the next phase of a young person's life. These efforts are still relatively new and small—in most cases about a decade old and reaching roughly 10% of students, but the hope is that they shine a light on some efforts that can advance the quality and depth of our work in the US.

Design: Five lessons learned



1 Start earlier.

While much of the work across the jurisdictions studied focused on upper secondary, or high school, there was a growing recognition that career readiness needed to start earlier. In Delaware, after looking at the uneven data on career pathways completion rates (Bellwether, 2023), policymakers determined that students were not ready to make informed choices at age 15 and needed to start exploring in the middle grades (ages 11–14). Rodel worked with national foundations (American Student Assistance, ASA), students, and state and local partners to define a “high school ready” student. From this, a pilot serving 5,700 middle school students across 10 schools was launched in 2023 and 2024, that pilot has grown by another three schools, now serving 8,100 students, and is on track to benefit all 30,000 middle school students statewide by 2030. (Delaware is not alone in this shift; see “Extending the Runway” study, ESG, 2024.)

In parallel, Delaware developed statewide social-emotional learning standards for kindergarten through 12th grade in response to concerns that new job applicants lacked communication, critical thinking, and problem-solving skills—what some call **social emotional learning** and others call **durable skills**. (See, for example, [this 2022 survey](#) of 350 Delaware employers.) They were subsequently integrated into the career and workforce development standards in 2022 (read more in [this 2022 CASEL case study](#)).

An even more comprehensive approach to starting earlier can be

To hear from some middle school students exploring career pathways in Delaware,

[click here](#)

found in British Columbia, Canada. [Back in 1989](#), provincial leaders put forward the idea that, to be an “educated citizen” in this global economy, students would need to be competent across three domains: intellectual development, social-emotional learning, and career readiness. The work on all three competencies [begins in kindergarten and culminates](#) in a two-semester course in grade 12 on preparing students for their careers and life. That course includes an understanding of basic finances and a “capstone” project capturing what students have learned and where they want to go next. Bonnie Alexander, Career Education Coordinator in the Victoria School District, described her work with teachers to weave “hands-on” career readiness content into the curriculum to “bring it to life.” She underscored the importance of starting early in helping young people gain an understanding of “who” they want to be more than “what” they want to be, explaining:

“*We know that kids start to make assumptions about their suitability to work as early as age seven. So all the programs that I run are meant to interrupt that trend, because we want students to learn about themselves and a broad range of careers so they can make better transitions after high school.*”

(Interview, February 2024)



2 Build around student agency.

From Edinburgh to El Paso, students came alive when they started telling me about their work-based learning experiences relative to their typical classroom experience. A student in British Columbia described the difference between her hands-on internship and traditional classwork this way:

“*In my internship, you learn ... about yourself because you’re trying things you’ve never tried before and you have to figure out what you like and don’t like, and you have to be the person to do the stuff. In high school... they give it to you, you do it, they tell you how you did, and you move on.*”

(Group interview, dual enrollment students, Camosun College, December 2023)

The same was true when I talked to a student from the Centers for Applied Science and Technology ([CAST](#)) in San Antonio, Texas, who shared with pride the full-size electric car he built and drives, and the lessons he learned about teamwork during his internship at Nissan’s Electric Vehicle division. Or the young woman at [Westlake Girls School](#) in Auckland, New Zealand, eager to explain how she and her team were able to apply their knowledge of virtual and augmented reality to build understanding of “invisible diseases” like mental health in her community. And a young woman in Aberdeen, Scotland, now a practicing nurse, who shared how the lessons she learned about de-escalation of disruptive children as a [Foundation Apprentice](#) in an early learning center still apply to her daily work in healthcare.

Beth Henderson

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For more on the ESAP program, see [this blog](#) on Canada’s approach to career pathways.

[click here](#)



Every school I visited across the five countries was full of similar examples, students wanted more real-life experiences.

Not only was it important for students to have experiences that pushed their learning and were more engaging, there was interest in having greater autonomy over their learning path. This was nowhere more present than in the Essential Skills Achievement Pathways (ESAP) in New Brunswick, Canada. In essence, while students have core requirements to complete, they also have a great deal of latitude and support to explore their career interests. Beth Henderson, ESAP Learning Specialist, explained her province's transition:

“We've done high school on a 20-credit hour program for 30 years. So, six years ago, we started the Essential Skills Achievement Pathway, which was a complete departure from the very stringent standard program. What Essential Skills allowed is skills-based and experiential learning. All of the other courses became a menu for the courses [students] would take that would align with their pathway. Within a couple of years people started to say, 'wow, we thought this was going to be very difficult and it's been the complete opposite.'”

(Interview, February 2024)

For students exploring one of the 75 options within the ESAP program, this takes effort, but they found it more engaging and relevant because it was based on their own interests. One student described being able to explore career options in high school that many young people don't encounter until after graduation:

“I started with welding, I was really enjoying it and then I was working under a buddy's car one day and it was all stuffy and I was surrounded by gases and I realized, I like welding as a hobby, but not as a career. I wanted to do something in the environment, so I got a work placement in forestry, and I just got into the Maritime Forestry College.”

(Group interview, February 2024)

In short, the young people I spoke to were hungry for greater agency—for control over what, when, where, and how they learned. The design challenge policymakers have is: “What's loose and what's tight?” What is the core set of content that all students should learn and what can students drive themselves?

This conversation about breaking from our traditional classroom schedule is underway in the US. Since 1906, American education has largely been defined by “Carnegie units,” or a standardized set of credit hours in foundational subject areas like reading and writing English, mathematics, and the sciences. As Carnegie Foundation President Tim Knowles shared, “it's time to move away from the Carnegie unit, and redesign it for a world that looks quite different a century-plus later.” Our friends to the north might offer some insights into how we can make this transition.



3 Design for “no wrong doors.”

For decades, general and vocational education have largely lived in separate silos, creating a two-tiered system with the former being associated with “white collar,” higher paying jobs, and the latter being associated with “blue collar” jobs and lower pay.

Traditionally, given that many of the higher education institutions did not recognize applied learning in their

admission processes, parents and students pursuing higher education saw no benefit in work-based learning.

This bifurcation is starting to soften as policymakers and parents recognize the benefits of honoring both. For example, in 2023, the Victorian government in Australia replaced the Victorian Certificate of Applied Learning (VCAL), which was the certification of those pursuing a vocational education, with the terminal degree of all other secondary students in Victoria, the Vocational Certificate of Education (VCE). While vocational students could add a vocational major to their VCE, their degree would be equivalent to, rather than lesser than, that of their peers.

For this push toward “parity of esteem” to take hold with students and parents at the secondary level, it was important for the postsecondary institutions to do the same. In Australia, [Pascale Quester](#), Vice Chancellor and President of Swinburne University of Technology, shared with me her university’s excitement to see student applicants with both a strong academic grounding and hands-on experience through [School-Based Apprenticeships and Traineeships](#).

We saw a similar shift in Scotland. When [Foundation Apprenticeships](#) (FAs) were launched, they brought focused work-based learning experiences into secondary schools tied to a high growth sector like healthcare or engineering. Graeme Hendry, Head of Government, Parliamentary, and Stakeholder Engagement, at Skills Development Scotland (SDS), shared that FAs initially didn’t count toward the four to five (“Highers”) or end-of-course exams needed to pursue higher education. Over the last few years, SDS has worked to ensure that FAs count toward higher education admissions, and universities are creating articulation agreements that enable students to pursue multiple pathways. As one professor at Robert Gordon University in Aberdeen shared, “The goal of our system is no wrong doors.” Meaning that, whether a student comes to the university with a Foundation Apprenticeship in engineering and wants to pursue a Ph.D. or a Graduate Apprenticeship, the pathways are meant to be permeable enough that, if a student changes their mind along the way, the system will be flexible enough to accommodate them without their having to start over and delay their career goals.

As Australia’s Anthony Mackay shared, there appears to be a push to “integrate the head and the hand” across these countries. That is, the hard historical divide—between the educational paths of those pursuing an apprenticeship and those pursuing higher education—seems to be softening. This notion of “no wrong doors” for students makes sense, because they don’t have to start over if they decide to modify their path. And it makes employers happy when young people have a mix of applied and academic experiences, providing them a more highly skilled workforce.

Graeme Hendry

Head of Government, Parliamentary and Stakeholder Engagement, Scotland.

For more on Scotland’s Foundation Apprenticeships, [see this blog](#)

[Click here for podcast](#)



4

Maximize access.

One of the challenges with creating seamless connections for every student to take advantage of dual enrollment courses and/or meaningful work-based learning

experiences is uneven access.

In every type of district, from urban to suburban, adequate transportation and access to employers can be a problem. In the US, where about 42% of US school districts are considered rural ([Gutierrez and Terrones, 2023](#)), access to strong work-based learning experiences can be particularly problematic.

Most districts I visited were leveraging a range of technological tools to address this challenge. Of course, online courses are now commonplace, and schools are increasingly leveraging artificial intelligence and virtual reality to simulate work experiences. For example, in San Antonio, Texas, I saw students conduct virtual autopsies in healthcare pathways, and in New Brunswick, students can explore a range of high-demand careers from construction to cyber security online through their [Future Skills Centre](#).

Beyond leveraging technology, some districts in southern Texas are working together in [Rural School Innovation Zones](#) (RSIZ). I visited five rural districts outside of El Paso working together to offer pathways ranging from healthcare to the skilled trades. There wouldn't be enough students or funding to warrant the creation of multiple career pathways in any one of those high schools. So each of the five participating districts "owned" the development of a specific pathway, and students in the four surrounding districts traveled to the academy of their choice. This requires early bus rides twice a week for participating students, but it's working, said RSIZ Executive Director Michael Gonzales:

“Across any measure—our five high schools have moved from among the lowest performing to among the highest. Three of our schools were rated “F” schools before we started the RSIZ, now all three are “B;” 98% of our students meet our state measure of college, career, and military readiness; and our attainment of industry-based credentials has quadrupled in the last five years.”

[Interview, November 2023]

With the recent passage of legislation in Texas to incentivize similar collaborations (see Rural Pathway Excellence Partnership ([R-PEP](#)) legislation), there are a growing number of “rural school innovation zones” across the state.

In British Columbia, five districts created the South Island Partnership (SIP) around a common higher education hub, [Camosun College](#). By working together, the five schools can identify enough students to fill dual enrollment courses that they couldn't afford to do alone. Students not only get a head start on college credits but can also begin their apprenticeship training with employers, what they call Red Seal journeyman training, while still in high school. Nicola Priestly, who is seconded from one of those five districts and serves as the director of SIP, shared that it creates community as well as cost savings:

Michael Gonzalez,

Executive Director, Rural Schools
Innovation Zone.

For more on the Rural School
Innovation Zones and the Texas and
Delaware career pathways stories,
[listen to this podcast](#)



” *As a partnership, we are able to spread not only expenses, but seat availability...One district isn't responsible for filling a cohort of 24 seats, each only needs to find five... With everyone contributing to the partnership, there's much more access and opportunity for larger projects. They're also constantly talking outside of SIP—that feeling of community is pretty magical.” (Interview, December 2023)*

Getting smarter about increasing access more effectively by leveraging technology or regional partnerships just makes sense. As the US labor market continues to evolve and young people's views on the education they want and need post high school evolve with it (see [ECMC Foundation](#) research on Gen Z's perception of four-year degrees), expanding opportunities for applied degrees, certifications, and flexible pathways aligns with both workforce needs and the next generation's priorities.



5 Focus on equity.

A concern with any new initiative is ensuring that it benefits all students, particularly those who have the most needs. If working well, career pathways should enable every student to maximize their potential, but if the range of student needs are not addressed appropriately, pathways have the potential to exacerbate societal inequities rather than mitigate them. This was a challenge across the jurisdictions studied.

While there's significant room for growth, I saw efforts to address equity in school visits across all five countries. In New Zealand, to address under-representation of women in the sciences, Westlake Girls School has developed an inspired Science, Technology, Engineering, Arts, and Math (STEAM) program. In British Columbia, I learned about [Pathways for Life Learning and Work](#), a seven-week program for students with physical and mental differences. And in New South Wales, Australia, I met with young women getting involved in a “taster” program that encourages them to explore the skilled trades. However, with the exception of the [Head Start](#) program in Victoria, Australia, which places over 100 staff across the state to support students in navigating their apprenticeships and traineeships, most of these efforts were targeted and not systemic.

In short, designing for equity was an opportunity for growth across the board. Going forward, jurisdictions should consider:



To hear more about the **Westlake Girls** STEAM projects and the broader work in New Zealand, listen to the podcast [here](#).



- Building the data systems needed to track not only participation but also completion rates across demographic groups.
- Directing targeted supports for subgroups across, race, gender, income, and ability, and then scaling those efforts with ongoing public funding.
- Augmenting counseling supports to ensure that all students can navigate work-based learning and dual enrollment opportunities.

Implementation: Five lessons learned



6 Put forward a compelling, common vision.

The policy and implementation frameworks for pathways sit at the nexus of education, workforce development, strategic economic growth, and social equity. With all these perspectives intersecting, it's important to build some level of consensus. Large-scale public systems are hard to move in part because so many of the players involved in their delivery can block innovation. A dynamic state leader can have a well-researched idea, but if she does not get the buy-in of the school district boards, teacher unions, parents, and students, the idea is unlikely to ever get off the ground. Likewise, public education is inherently political (not least because of its large share of local and state budgets), so even sound ideas won't move without political alignment. British Columbia's Angie Calleberg explained the importance of listening to earn buy-in as follows:

” *Transformational change here really happened because of an open and transparent process. Bringing in every single perspective that's going to want to have a voice is absolutely essential. [In addition,] starting with a very strong research foundation is pivotal for governments to be able to work with their political leaders in a systems change approach.*”

(Interview, February 2024)

It's not surprising that, in all of the jurisdictions that were moving toward large-scale change, regional, state, and national leaders have worked together on building consensus around a set of research-based approaches that were then vetted and modified based on multiple rounds of broad public input. To move this work forward, policymakers and practitioners published research on what's working and engaged leaders across domains to craft a credible “north star” for playing out the new approach. From the [Firth \(2020\)](#) and [Shergold \(2020\)](#) reviews in Australia, to the [Wood \(2014\)](#) review in Scotland, and Delaware's [Student Equity and Excellence 2035](#) and [Career Pathways Strategic Plan \(2017\)](#), we saw a framing document serve as inspiration for deeper investment, collaboration, and innovation.

In sum, as jurisdictions consider building career pathways at scale, investments in sound research and a transparent community engagement process are important to set the stage and catalyze transformational change.



7 Invest in change management.

Across the five countries visited, we heard some version of the following from principals and educators in schools:

” *I support the vision in the report. I’ve seen it benefit students. But parents don’t see how time out of class on a worksite will help their student get into university, and my staff and I are evaluated based on academic performance. In short, our incentives, timetables and funding don’t support doing anything different, and I’m short-staffed. So, while I agree with where the state wants to go, I don’t know how to get from here to there.*”

(Paraphrase from a principal at a school visit in New South Wales, Australia, April 2023)

The shift toward career pathways is not just about changing practice within schools. It is about building new bridges and infrastructure to create smooth transitions among schools, higher education providers, and employers. Moving from policy to practice is challenging, and each jurisdiction had a response that made sense for its context. Skills Development Scotland (SDS) built a strong policy team at the federal level that tracked labor market information and put forward strategic solutions, ensured public funds and policies were enabled, and had staff in all 350 of the country’s high schools working to ensure smooth implementation of their [Foundation Apprenticeships](#). Graeme Hendry, SDS Head of Government, Parliamentary and Stakeholder Engagement, described SDS’s role as “the glue that holds the work together between the government, the schools, and employers.”

Likewise, in Victoria, Australia, a new team called the ‘Senior Secondary Pathways Reform Taskforce’ was created to lead implementation of the Firth Review (2020) recommendations. This team of about 80 people works on policy redesign, communications, and implementation. Victoria has dedicated about \$100 million Australian dollars per year over five years to support the change management process.

As new systems were being built in these countries, a range of public and private “intermediaries” played important roles. They help build the bridges and connect the dots needed to help establish long-term policy changes. In Scotland, SDS worked with local partners known as “Developing the Young Workforce” in each of the 32 council areas nationally. In British Columbia, Camosun College served as an intermediary across five districts looking to connect their students to apprenticeships and dual enrollment credits. In Delaware and Texas, nonprofit organizations like Rodel and Educate Texas worked to build statewide coalitions and funding to support the work in partnership with state agencies, employers, and other non-profit and higher education partners.

Unlike the public sector efforts in the Commonwealth countries in this study, the work of intermediaries in the US are often heavily reliant on philanthropy. An [analysis](#) by Education Strategy Group (2024) noted that 69%

Natalie Garcia DeHeer,

Assistant Deputy Secretary, Senior Secondary Pathways Reform within Victoria’s Department of Education, Melbourne.

In the state of Victoria, Australia, there’s been a broad commitment to investing in this change management process. Hear more about it [in this podcast](#)



of the intermediaries they interviewed nationally had a single funder who provided more than one-third of their lifetime revenue. This isn't a sustainable strategy. As states work to build systems that create seamless connections among high schools, higher education institutions, and employers—investing in intermediaries to connect these fragmented partners is an important step in the process. However, jurisdictions would be well-served if those catalytic investments were coupled with longer-term, public-sector investments, like those made in Australia and Scotland. See more below in lesson 10, Moving from Pilots to Policy.



8

Co-design with employers.

Employers across these five countries tend to be facing the same challenge as the US: more jobs than job seekers.

Kevin Kelman, Director, National Health Service, Scotland Academy, Learning & Innovation, shared the challenge and how they are working with the schools to address that challenge:

Kevin Kelman

Director, National Health Service,
Scotland Academy, Learning &
Innovation

To learn more about this employer's perspective and to hear perspectives from Scottish policymakers and students, [see this blog](#) and [listen to this podcast](#).



There's a sharp decline in the number of individuals who want to move on the undergraduate nursing program. So, we've just embarked on an international recruitment campaign to bring nurses from different parts of the world to Scotland. So, we see the need and we're working with the [Foundation Apprenticeship program] to develop a cohesive learning pathway that can be built from school into the world of work...I think we need to reimagine the ways schools and local employers work together."

Not surprisingly, changes in the high school experience tend to originate from the schools. School or district leaders often broker relationships with higher education partners for dual enrollment and engage local employers to establish work-based learning placements. This makes sense as a starting point, but employers need to see their involvement as more than good corporate citizenship for this to take hold. Many American school districts have employer advisory boards to help inform what they do, but often times these are not very meaningful. In order for employers to have genuine buy-in, there needs to be a clear return on investment, genuine engagement on credentials and training aligned to current and future needs, and support to make employer involvement easy.

Compared to the Swiss model, building a clear ROI for American career pathways efforts is more difficult. Students in the Swiss apprenticeship model tend to have multi-year relationships with the same employer from age 15 through employment, so tracking the costs and benefits over time is [relatively straightforward](#). In the US, career pathways students tend to engage in job shadowing or potentially a paid internship with employers, and participating students are not necessarily committed to a specific company post-graduation.

Good early work in Delaware and Texas has helped to align career pathways to high-growth and high-demand jobs. For example, in 2021, Delaware worked to strengthen connections among tech companies and their talent pipelines by creating the [Tech Council of Delaware](#). Texas underscored the importance of high growth sectors by passing enabling legislation ([House Bill 3](#)) encouraging partnerships with employers.

As states look to strengthen their employer-partnerships, Skills Development Scotland has resources for how to work with employers in co-designing industry standards ([Scottish Standards and Frameworks](#)). For those looking to work with employers to structure productive work-based learning experiences, the work of [Regional Industry Education Partners](#) in New South Wales, Australia is informative. Established in 2021 within the state's Department of Education, the unit works to co-design meaningful work-based learning activities with employers and schools. As of 2022, the 26 staff members had connected over 600 schools to more than 1,400 employers.

While US policymakers are making headway on engaging employers in career pathways design (see [this](#) US Department of Education playbook), there's more work to be done to build the case to employers that the pathways effort is foundational to their bottom line.



9

Build the blur.

In 2021, Jobs for the Future made the argument in “The Big Blur” for “blurring” the lines between high school, college, and careers. “[The Big Blur](#)” can take many forms. To implement quickly and at scale, policymakers can expand or strengthen existing programs that blur the lines between high school, college, and careers, rather than designing new ones from scratch. Texas has seen tech-aligned, early college high schools (P-TECH) flourish, Delaware is accelerating registered apprenticeships by enabling high school students access the adult education courses they need for their apprenticeship while still in high school; and Victoria, Australia is reinforcing school-based apprenticeships and traineeships with dedicated teams providing navigation and support.

Victoria's [School-Based Apprenticeships and Traineeships](#) (SBATs) allow students to pursue an apprenticeship (largely in the skilled trades) and traineeships (which cut across a range of administrative and professional fields) while still in high school. To help them make informed choices, every grade nine student engages in a diagnostic self-assessment of aptitudes and interests, which is reviewed with a trained guidance counselor to help the student design their course load for the years that follow. To ensure that students across the state have access to the supports they need to get to the apprenticeships and traineeships they've chosen, the state has invested heavily in a program called “Head Start,” which includes over 100 personnel spread across the state and embedded in schools to help students navigate the supports they need.

In Delaware, about 17% of high schoolers attend one of the state's six vocational schools. Licensed journeyman apprenticeships in a skilled trade (such as electrician) can take four to five years to complete. To accelerate this process, the vocational schools have worked with community partners and the state since 2021 to align their coursework with the adult certification programs that they manage, helping roughly 900 students shorten their apprenticeship process, similar to how dual enrollment accelerates the college experience. The state is working to expand this program tenfold over the next three years by building articulation agreements with the other 83% of high school students in comprehensive schools that might want to pursue an apprenticeship.

Even relative to the general education peers in this study, the US has a low number of registered apprentices: 600,000 [according to the DOL](#), or less than 0.4% of the [labor force](#). If the share in the US were as high as the average across the UK, Australia, and Canada, that number would need to be increased at least five-fold, to closer to four million. As US policymakers look to strengthen career readiness at the secondary level and

more specifically, expand apprenticeships in high-demand fields, there are opportunities to leverage existing infrastructure, build on what's working here, and look closely at places like Victoria that are embedding thoughtful diagnostics and personalized supports to scale these efforts.



10 Move from program to policy.

A decade into this latest iteration of career pathways in the US, we have a robust mix of efforts across the country (Schwartz and Loyd, 2019), but we still lack scale and consistently high quality in most states. Moving big systems is hard. The default strategy, particularly in the US, is to pilot an idea with philanthropic dollars or a small public sector grant with the assumption that, if it works, policymakers will see the wisdom in the idea, invest in it, and it will grow. Unfortunately, if public sector partners are not involved in the design from the outset, many of those pilots dry up when their initial funding does. Unlike the other four countries visited, the US invests massive amounts of philanthropic funding into catalyzing new ideas to support public and private sector education. A 2024 Grantmakers for Education analysis found that roughly 119,000 private grantmaking institutions in the US invest \$34B per year in education (Grantmakers for Education, Candid, 2024). That's almost twice the amount spent on US public schools through the largest federal funding source, Title I (\$18.4 billion in 2023). In short, in the US, we are good at innovation but less good at scaling what works.

Here, again, our Commonwealth peers offer lessons. To create more coherence across education, the workforce, and the economy, Skills Development Scotland is a strong example of a publicly funded agency that bridges those gaps. In Canada, Australia, and Scotland, the large-scale reforms to build a new definition of an educated citizen or create parity of esteem across vocational and general education approaches all came from the public sector engaging in thoughtful reviews of the research, engagement with their communities, and leadership at senior levels of government putting forward substantial public investments and staff capacity. In short, if states and localities across the US want to scale and sustain their efforts, they should be more strategic about how philanthropic dollars are used. Used with care, these dollars can catalyze fundamental shifts in how public sector systems innovate and evolve. Ryan Franklin, Senior Director of Policy and Advocacy at Educate Texas, described how philanthropy has worked with nonprofits to pilot promising ideas early on and if the idea demonstrates success, the state legislature has demonstrated a willingness to make larger, longer term public investments. He shared:

” One of the things Texas has done well over time is support the front end of legislation [with philanthropy] and then reward the back end [with public sector commitments] as a way of sustaining it... Multiple systems coming together are necessary to making a change.”

(Interview, February 2024)

Ryan Franklin

Senior Director of Policy and Advocacy
at Educate Texas

To learn more about progress in Texas, [read this blog](#) and [listen to this podcast](#).



Given strong bipartisan support for career pathways in the US, we are starting to see some of those shifts from pilots to policies. In 2024, 47 states reported legislative or executive action to advance career and technical education ([Education Week, 2024](#)). The work ahead will require building the governance models, data systems, and funding strategies that serve to pull the investments of time and resources from labor, education, and the workforce into one coherent system.

Conclusion

In the words of Australia’s Anthony Mackay, “we are seeing the breakdown of the artificial divide between the head and the hand.” All five of the countries I visited are fairly new to the latest iteration of career pathways, but the shift toward bringing more of the real world of work and postsecondary learning into the high school experience, and perhaps redesigning it all together, is clear.

Another major takeaway from talking to 250 students across five countries was that pathways efforts meant more than simply preparing them for a job. This was about helping them experience the world outside of high school and helping them begin to wrestle with real-world challenges and build the skills they will need to thrive in life.

This project and the associated [working paper, blog posts, and podcast episodes](#) aim to raise awareness of the good work underway, inform the conversation, stimulate questions and dialogue, and strengthen learning networks across the globe. If done well, pathways can support young people to find careers that inspire them to contribute to their communities—while helping this nation evolve to meet the needs of our rapidly changing world.

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