

RUTGERS EDUCATION AND EMPLOYMENT RESEARCH CENTER

LESSONS FROM EUROPEAN STATES:

POLICY AND PRACTICE IN CAREER AND TECHNICAL EDUCATION

HEATHER MCKAY JUSTIN VINTON JAMES BOYLE MICHELLE VAN NOY

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School of Management and Labor Relations EDUCATION AND EMPLOYMENT RESEARCH CENTER Janice H. Levin Building 94 Rockafeller Road Piscataway, New Jersey 08854 smlr.rutgers.edu/eerc



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EXECUTIVE SUMMARY

The changing nature of work raises many questions for the US education system about how to prepare skilled technicians. As work changes and the pace of innovation accelerates, technicians will need to acquire new skills. Conversation abounds about the future of work, the potential for widescale change in work processes, and even the kinds of jobs people will do in the wake of advances in automation and technology (Autor et al., 2019; OECD, 2019b). The shifts to remote learning and work caused by the pandemic have further complicated this reality.

These changes will require career and technical education (CTE) systems in the United States to adapt their approaches to technician education in a myriad of ways. It will be important for workers to be able to acquire new skills throughout their life course, for education to keep up to date with changes in industry, and for workers to have the opportunity to retrain as jobs shift and disappear. Because this phenomenon is global, there is value in looking at how other countries are responding to these realities. The EU, with its highly developed economies and various approaches to what they refer to as vocational education and training (VET), offers potential lessons for the US CTE system. This paper broadly discusses VET policies across six countries in Europe—Austria, Denmark, Finland, France, Germany, and Spain—along with the lessons they offer the US CTE system and potential policy and practice implications. Appendices A through F provide short briefs on each of these systems.

The discussion is focused on many of the policy and practice changes that were put in place in European VET systems following the Great Recession. As a response to this economic crisis and the growing interest in VET in many countries, an effort was made to alter the character and structure of European VET systems to promote adaptation to change. This resulted in a variety of shifts and changes to VET policy and delivery structures designed to provide more opportunities for lifelong learning, reskilling, and upskilling. These changes were intended to create new avenues through which the workforce could adapt to changing industry needs, and workers would have new career and educational pathway options. Across the countries we studied, these adaptations included:

- implementation of multiple entry and exit points;
- creation of educational pathways between VET and more traditional academic study;
- recognition of non-institutional learning; granting local authorities the ability to adapt and shape curriculum to local industry needs; modularization of curriculum;
- development of structures for work-based learning; training and professional development in industry for VET teachers; and financing VET for workers (youth and adults) and employers.

In many cases the approaches we highlight are practices that are already happening in the United States but may not be done to scale or may be approached differently. Some of these differences are of course partly due to context and the structures of the systems in Europe versus the United States. However, there are policy and practice tools that could be transferred to American CTE in a more formal way. As such, we think that a close examination of how these practices have been executed in various European contexts is both useful and timely as the U.S. begins to rethink federal and state CTE policies as well as CTE systems and institutional activities more broadly.

INTRODUCTION

The changing nature of work raises many questions for the US education system about how to prepare skilled technicians. As work changes and the pace of innovation accelerates, technicians will need to acquire new skills. Conversation abounds about the future of work, the potential for widescale change in work processes, and even the kinds of jobs people will do in the wake of advances in automation and technology (Manyika et al., 2017; Autor et al., 2019; OECD, 2019b). The shifts to remote learning and work caused by the pandemic have further complicated this reality. Predictions of the breadth and depth of this change vary, with some scholars stating that between 10 to 50 percent of jobs will disappear or change drastically in the near term (Arntz et al., 2016; Frey & Osborne, 2017). However, while automation may change what work we do and how we do it, it also has the potential to create new opportunities for some workers (Bessen, 2020).

Technicians play an increasingly important role in the changing economy. A recent report on the skilled technical workforce highlights the importance of technicians and technician education to the American economy as new technologies and automation change the pace of production and productivity (National Science Board, 2019). Technicians mediate technology and practice in their work, an often-unseen process (Barley & Orr, 1997). As trained mid-level workers, technicians interact with technology in both high-end research and development (R&D) and practical execution (Barley, 1996). This can lead to novel innovations as well as to advances in productivity at firms and across entire regions (Helper et al., 2018).

In the United States, community college technician education programs prepare the nation's skilled technical workforce across many fields. These include information technology; manufacturing; agricultural and environmental, bio- and chemical engineering; and nanotechnology. They may result in associate degrees, short- or long-term credit-bearing certificates, or industry certifications, such as those offered by CompTIA in information technology or by the National Institute of Metalworking Skills (NIMS) in manufacturing. These programs are expected to be up to date on industry needs and to act as a conduit to local industry. Given the changing and innovative nature of their associated industries, however, technician education programs find themselves at the center of the rapid changes in technology. Community colleges prepare technicians and thus are central to this conversation.

Adjusting to these changes will require our career and technical education (CTE) systems to adapt in a myriad of ways. It will be important for workers to be able to acquire new skills throughout their life course, for education to keep up to date with changes in industry, and for workers to have the opportunity to retrain as jobs shift and disappear. Because this phenomenon is global, there is value in looking at how other countries in the world are responding to these realities. The EU, with its highly developed economies and various approaches to what they refer to as vocational education and training (VET), offers potential lessons for the US CTE system. Our goal here is to discuss VET policies across six countries in Europe—Austria, Denmark, Finland, France, Germany, and Spain¹—along with the lessons they offer the US CTE system and potential policy and practice implications. See the Appendices for detailed accounts of each country's VET system and structure. The EU systems we present offer illuminating examples of both broad VET standardization and quality as well as employer- and system-driven transferability and flexibility innovations within VET systems that can translate to similar innovations in US CTE. In some cases, the features we highlight are practices that are already happening in the United States but may not be done to scale or may be approached differently. Some of these differences are of course partly due to context and the structures of the systems in Europe versus the United States. We believe, however, that a close examination of how these practices have been executed in various European contexts is both useful and timely as the U.S. begins to rethink federal and state CTE policies as well as CTE systems and institutional activities more broadly.

METHODS

This report involved two primary activities. First, we conducted a literature review. We searched academic databases and conducted internet searches on numerous terms in varying combinations to find relevant articles and resources for each country in our study, including but not limited to: Vocational Education and Training (VET), Career and Technical Education (CTE), Vocational Advanced Technological Education (ATE), technical education, technicians, vocational education, workforce education, occupational education, career pathways, artificial intelligence (AI), skilled technical workforce, STEM programs, middle skills, and stackable credentials. We also searched within the OECD website and those of related organizations as well as government webpages dedicated to VET. To keep track of the useful articles and other resources we found, we kept an account of search terms used, source title, URL, date of the source's publication, and the date accessed. We also downloaded a PDF file of the document if one was available and wrote a short summary. These source characteristics were able to be filtered by country. We used the citation software Zotero to keep track of citations.

The second step was to conduct interviews with one or more experts on VET from each country to fill in some descriptive questions or gaps that may have been missing from the literature, and to get a better understanding of the actual implementation of VET in each country. To do this, we made contacts through various colleagues, including the supporters of this grant. We also reached out to authors of the relevant articles we found through email. We then set up hourlong virtual interviews through Zoom using a semi-structured interview guide. In total, we spoke to 11 experts and academics.

EU VET IN CONTEXT

This research identifies some of the main EU VET models and methods that have applicability in the United States. Looking to other contexts for lessons on skills development has precedent.

¹ The VET systems in each of these countries are described in detail in appendices to this report.

(e.g., Ibsen & Thelen, 2020; Autor et al., 2019; Busemeyer & Trampusch, 2012). In the sections below, we provide background on how the U.S. can use lessons from the EU. This includes a discussion of the basic institutional structures in the EU relative to those in the U.S. to provide context on the parameters in which the systems operate. We then provide more background and context on current developments in the EU, including changes in the VET system since the Great Recession, as well as current challenges to the EU VET system associated with the future of work.

Institutional Differences Across the EU and US Systems

Fundamentally, the US and EU countries have different institutional structures that are important to understand when examining VET practices. These institutional structures can help provide insight on how policies and practices can be imported across contexts. At a high level, the U.S. and the EU differ in the development and implementation of VET curriculum and in the degree of coordination among institutions. EU VET systems are more centralized as a result of the region's coordinated market economy compared; in contrast, the less coordinated and structured approach of the U.S. CTE system reflects its liberal market economy (Hall and Soskice, 2001).

Skills formation systems or VET can further vary across these country contexts based on the involvement of firms in VET. Countries' VET training can fall under a few types of systems (Busemeyer and Trampusch, 2012):

- Statist: Programming is driven primarily by the state, yet also with firm and union involvement.
- Segmentalist: Firm investment in training exists, but general education is primarily obtained through markets.
- Liberal: Skill formation emphasizing general skills is obtained through markets, with firms or community college providing firm-specific skills but with varying quality.
- Collectivist: Firms and intermediary associations such as employers' associations, union associations, chambers of industry, and tripartite committees are heavily involved in programming decisions.

The U.S. falls under the liberal system, while the EU countries in this study are either statist or collectivist systems. (Table 2 later in the paper discusses each countries' categorization and the involvement of stakeholders in curriculum development.) These categories provide a structure from which to think about flexibility and adaptation and offer a tool to compare the models described in the six country appendices below with the US CTE system.

Of note, there are some clear benefits that can be gained in terms of both quality and transferability for VET in statist and collectivist systems that are not possible in a liberal system. The greater degree of coordination in these systems allow for more systematic and widespread changes that can pave the way for adaptation at a wider scale than with a liberal system. This is

an important consideration as one thinks about the realities of the fast-paced changes that are increasingly needed to respond to a world with everchanging technology, and an important difference when considering importing reforms across contexts.

Other important differences in the EU and US contexts have to do with the balance of power between workers and employers. Countries with strong social dialogue and VET systems can maintain more equitable skill distributions in their respective labor markets. This is primarily because of governance structures in VET that give a relatively equal voice to the state, training partners, employers, and workers. In contrast, the strong power of employers in US labor markets underscores that it is not just the absence of social partnerships or accessible vocational training that drives wage and skill inequality in the U.S., but rather how the nature of the social partnership itself often leaves workers without a meaningful voice or control over the systems and programs that are designed to enhance their skills.

While US unionization rates have been declining over time, the average collective bargaining coverage of the six countries in this report is over 83 percent of the workforce (OECD, 2021b); in France and Austria in particular, that number is 98 percent of their respective workforces. These conditions allow workers to meet employers on a more equal playing field when designing and implementing VET systems, anticipating skill needs for both employers and workers, and determining who reaps the benefits of VET. Of note, collective bargaining coverage is on a downturn throughout the EU (OECD, 2021b)). However, in the U.S., the situation is more dire, with only about 12 percent of the workforce holding collective bargaining coverage (OECD, 2021b). This significantly limits workers' ability to advocate their needs when negotiating training programs at the firm, industry, and sectoral levels (and beyond). Research demonstrates that US employers' labor market power has increased dramatically relative to faltering collective bargaining power for workers, allowing companies to increase their skill demands for incumbent workers and/or look for workers with higher skill levels without paying higher wages (Modestino et al., 2015; Naidu & Sojourner, 2020).

Changes in EU VET Since the Great Recession

The 2008 Great Recession marked a change in EU VET systems. This period sparked a mass wave of youth unemployment across the EU, reaching upwards of 20 percent across member states in 2009 (Heyes, 2013). Some countries, such as Spain, also experienced significant increases in unemployment among older workers (Heyes, 2013). Countries that fared the best typically had strong VET systems with additional employment protections. In response to the crisis, the European Commission elevated "flexicurity" as the dominant employment policy prescription to address rapidly increasing unemployment levels (Heyes, 2020). It is important to define exactly what this means in the context of VET. According to the European Commission, flexicurity is an "integrated strategy to enhance, at the same time, flexibility and security in the

labour market" (European Commission, 2007). Under this agenda, VET combines with active labor market programs (ALMPs) to ensure that workers maintain employability through crisis periods. In this way, the employment crisis caused by the recession encouraged many countries in this study to rapidly increase spending on training. In the case of Denmark, Germany, France, and Austria, this increase in spending marked a distinct policy reversal, occurring after relatively sustained periods of reduced state spending on training measures going back to at least the late 1990s.

However, despite the short-term increase in state spending, most countries struggled in terms of maintaining work-based learning opportunities due to the worsening economic conditions in many companies. Research shows that firms become less inclined to take on apprentices and trainees during economic downturns, and the 2008 crisis was no different (Brunello, 2009). Germany in particular felt the impact of this reality its dual system, despite its historically high employer cooperation and support. While the system initially remained healthy during the crisis (and was elevated as a model for other European countries where VET

U.S. VET Changes After the Great Recession

Perhaps the most consequential response to the Great Recession in the U.S. vocational education system at the national-level was the implementation of the Department of Labor's Trade Adjustment Assistance Community College and Career Training (TAACCCT) grant program, which provided over \$2 billion in funding to higher education institutions between 2011-2014. In some ways, TAAACCT grants helped to encourage VET institutions (primarily community colleges) to become more innovative, accessible, and form stronger partnerships with employers (Milkeson, et al., 2017). They also provided an opportunity for community colleges to acquire new technologies and improve curricula to respond to local needs and the changing needs of different industry areas. out-of-pocket costs to access VET, which remains a substantial difference between the U.S. and EU VET systems (Snyder & Dillow, 2011). However, these changes to policy and practices were not necessarily institutionalized and, in many places, the good work that occurred during the grant period faded as the funding sunsetted.

systems quickly went into freefall), the number of apprenticeship contracts began to fall as early as 2009. State subsidies increased to encourage companies to take on apprentices, particularly students who had been displaced as a result of the economic crisis. However, subsequent negotiations between the state and employers revealed a tangible decrease in the propensity for German companies to offer apprenticeship opportunities. As a result, concessions were made in terms of the total number of apprenticeship contracts to be annually made available, and contracts were amended to reflect reductions in training duration, working hours, and employment protections for apprentices. This infuriated many German trade unions and caused most to leave the negotiations over the national-level apprenticeship pact (*Ausbildungspakt*). Other countries experienced similar reductions in employer interest in apprenticeships (Heyes, 2020).

Despite issues with apprenticeship availability, Germany's use of short-time work in combination with expanded training opportunities for workers on short-time was regarded as a smart strategy for weathering the Great Recession. Short-time allows workers to retain their

jobs at a reduced number of hours while upskilling; at the same time, it allows employers to retain their skill base in their workforce, placing them in an advantageous position when the economy begins to move into recovery (Heyes, 2013). Though short-time work was lauded as a successful model during the Great Recession, most apprentices were not put on short-time work during the COVID-19 crisis (CEDEFOP, 2020).

While Germany mostly worked to preserve its more holistic and fairly rigid dual system by offering workers on short-time work expanded training during the Great Recession period, other countries worked to more fundamentally alter the character and structure of their VET systems to promote more flexibility during the crisis. One such strategy was to combine a reduction in the number of qualifications with a broadening of training content. This led to the incorporation of more transversal skills in VET programs that allow learners to cover a wider range of skills and competences. In addition, rapid technological changes in the wake of the Great Recession have encouraged many countries to reorient VET curricula around delivering digital transversal skills needed for more high-tech occupations and work environments. Denmark is an example of a country that has taken this route by simplifying VET curricula to cover four main occupational categories and by expanding the range of skills covered in VET courses (CEDEFOP, 2018a). Notably, the country saw an increase in participation in continuing training following the start of the recession (Heyes, 2013).

In the period following the crisis, some countries have found that decentralization of governance over VET has helped encourage more flexibility in programming to respond more directly to local needs. For example, French reforms in 2014 gave regions more control over the management of training policies, implementation of VET, and support for small- and medium-sized enterprises. The creation of regional public training and guidance services were also part of these reforms. Overall, decentralization has encouraged decision-making and management authorities to align VET systems more closely with local labor market realities (CEDEFOP, 2018a).

These kinds of reforms generally incur more autonomy at the level of training delivery and allow the system to more quickly respond to labor market and economic changes. Moreover, new curricula can be adopted fairly rapidly under this structure. CEDEFOP (2018a) examines the advantages of this approach compared with systems aimed at providing a broad foundation that can be adapted to meet more specific needs. Their research shows that new courses implemented rapidly run the risk of delivering skills that become obsolete just as quickly, while broad courses, although still flexible, often are difficult to reform if the labor market undergoes significant and rapid changes. In other words, more localized structures for VET administration need to strike a balance between delivering more specific training programs that can respond to immediate local needs while also continuing to provide broad-based transferable skills that workers will need in the labor market in the long-term (CEDEFOP, 2018a).

Another strategy some EU countries have implemented to encourage VET flexibility post-2008 is increasing the number of educational pathways to higher education available to VET students

as well as the number of linkages between VET and general education systems. This occurs in a variety of ways. National qualifications frameworks can allow learners to acquire qualifications through multiple pathways, including through training delivered outside of formal systems. Finland, for example, created pathways that allow learners to progress from upper secondary VET to higher education. France, on the other hand, focused on establishing distinct VET tracks within higher education (CEDEFOP, 2018a).

On a more granular level, some countries have allowed greater flexibility in terms of what is actually being delivered within a specific training course or program, encouraging more individualization of learning outcomes designed to meet the needs of both learners and employers. This is the case in Finland, which has established a strong basis for more individualized training pathways. France offers all workers the right to a skills assessment every two years as well as a personal training account that can be used for programs of their own choice instead of what their employer proscribes them (CEDEFOP, 2018a). While flexibility reforms have had fairly positive impacts on the VET systems in which they have been implemented, flexibility as an inherent good in the context of VET also may be challenged by how it operates in the broader labor market. In more regulated (less flexible) labor markets, there is typically more certainty on investments in VET, in terms of both the destination of particular training pathways as well as the return on investment for employers who provide training (Acemoglu & Pischke, 1999). In more flexible labor markets, there is less assurance about where a certain training program may lead, as well as greater risk for employers making investments in training (Gambin & Hogarth, 2016). In addition, many VET flexibility agendas have been implemented in combination with relaxed restrictions for training companies to pay into social security and other employment protections for their apprentices and trainees (Heyes, 2020). While these tradeoffs may encourage more apprenticeship contracts by helping training companies reduce costs, they may in turn hurt apprentices' economic security in the long run (Heyes, 2020).

Another important post-2008 development is the persistent issue of youth unemployment that remained high in most EU member states even after the implementation of more flexible VET opportunities. Even unemployment among young people with a tertiary VET education (typically a higher level than what most VET graduates hold) reached upwards of 18 percent by 2011. These trends help illustrate that while flexible VET options are certainly lifelines in periods of economic crisis, they may not address the root causes of employment crises. Heyes (2013) argues that "areas of skills shortage notwithstanding, Europe's current problem is not a lack of skills but a lack of jobs and a lack of policies to create jobs. Austerity measures and a new fiscal pact in the Eurozone are placing additional constraints on government spending and are likely to further encourage policy-makers at [the] national level to pursue reforms designed to dilute social and employment protections, bolster ALMPs and improve 'employability.' " Heyes (2013) suggests that a more effective strategy to address employment crises may be linking flexible training policies with industrial policies that provide workers with immediate economic relief and promote the growth of decent work. In other words, the dual goals of flexibility and security need to have equal weight if a flexicurity agenda is to be effective at both protecting

workers from economic shocks and allowing them to enter post-crisis periods with the skills they need.

These post-2008 moves toward a more flexible delivery of VET for learners and the labor market offer a potential template for reshaping VET policy and practice in the changing economy.

Over the past few decades, the European Union (EU) has made significant attempts to coordinate and formalize an agenda to create a fairer knowledge-based economic system in the face of globalization and technological change.

The goal has been to broaden and improve the attainment of human capital, skills, and education and training across its member states. These include EU policies like the Lisbon Agenda, which is intended to meet the goal of becoming the most competitive economy in the world (Lisbon European Council, 2000), as well as the Bologna Process, which is focused on removing barriers to reaching this goal and providing alternative opportunities to traditional academic education (Schulze-Cleven, 2017). Yet, even in Europe there are still clear cross-national and institutional differences in skills development and VET, with models that are more or less effective in certain regions and contexts.

EU VET and Future of Work Challenges

In the current environment, the EU is confronting significant challenges in adapting to the changing world of work, many of which have been exacerbated by pandemic-fueled shifts. The increasing pervasiveness of remote and digital working environments has both emphasized the need for digital skilling/upskilling and de-emphasized manual skills in labor markets across the EU. A recent forecast by the European Centre for the Development of Vocational Training predicted that, in sectors that have experienced outsized impacts from the pandemic, between one fifth and one quarter of new jobs created in the next decade will be at risk of automation (CEDEFOP, 2020). Moreover, pre-pandemic surveys showed that, while about 70 percent of adult workers in the EU need some form of digital skills to complete their jobs, about a third of these workers are at risk of digital skill gaps as workplace technology changes (CEDEFOP, 2016b). In their revised 2020 European Skills Agenda, the European Commission highlighted the need for ensuring that 70 percent of the EU adult population has basic digital skills (European Commission, 2020a). The realities will require both skilling systems for new workers and upskilling or reskilling of the current workforce.

Despite the strong systems for adult education, training, and retraining in the VET systems analyzed in this report, participation of adult workers in VET remains low across EU countries, only averaging around 11 percent in 2018 (European Commission, 2016). In addition, only about 1 in 10 unemployed adults across the EU have had a recent learning experience (European Commission, 2020b). Demands for adult reskilling may increase as the population continues to age across the EU. The working-age population is expected to decline every year through 2060, as is the ratio of working-age people to people 65 and older. In 2006, that ratio was 4:1; by 2050 the ratio is projected to reach 2:1 (Kiss, 2020). However, some countries in this

report—including Finland, Denmark, and France—have adult education and training participation rates upwards of 20 to 30 percent, underscoring how their approaches to adult education and retraining may stand out as successful exceptions among those of other EU countries (European Commission, 2016).

The European Commission has identified this issue as a core policy agenda item. Among other activities in its 2020 Skills Agenda, the Commission will be working toward the following goals of interest to the current study:

- Advance Skills Pacts—large-scale partnerships at the regional and industrial levels cocreated by all stakeholders to advance training in upskilling within their domain.
- Strengthen skills intelligence mechanisms.
- Establish a new Europass online platform that will allow users to communicate their skills to prospective employers, connect to jobs, and enable training providers to issue digital diplomas.

The Commission will also be launching an initiative centered on individual learning accounts for adult learners and another on developing an EU-wide policy on micro-credentials by the end of 2021 (European Commission, 2020b).

Perhaps more pressing, while young graduates of VET systems across the EU have better employment prospects than general education graduates for at least their first decade on the labor market, this difference tends to disappear as workers get older. Moreover, about a quarter of young VET graduates are working in jobs that are at a high risk for automation. These employment prospects again emphasize the critical need for enhancing continuing education and retraining, particularly for VET graduates, across the EU. The OECD identified Germany, Denmark, and Austria as countries in which VET employment outcomes remain positive because of strong ties between VET institutions and social partners, relationships the organization recommends extending to member states with weaker VET systems (Organisation for Economic Co-operation and Development, 2020).

Young people across the EU have faced increasing volatility in the labor market since the Great Recession. Youth unemployment has been rising, now averaging at around 17 percent across the EU (Eurostat, 2021). Young people in the EU have also been disproportionately impacted by the wave of pandemic-fueled unemployment growth in 2020, resulting in an average youth unemployment rate of around 17 percent across the EU (Eurostat, 2021). In addition, recent analysis from CEDEFOP describes how a considerable proportion of young workers are overqualified for their jobs, underscoring how polarization in the labor market with a bias toward low-skilled jobs remains a persistent issue (CEDEFOP, 2015).

Labor market polarization has been an ongoing—and hotly debated—trend in the EU for at least the past two decades (Oesch & Piccitto, 2019). Across the EU, the share of middle-skilled workers has declined relative to more rapid growth at both the top and bottom of the skill distribution in the labor market. While automation is partially responsible for these changes, the

OECD concludes that at least since the 1990s, successive cohorts of young workers have been increasingly less likely to enter the labor market in middle-skill jobs (i.e., truck driver, machine operator, cashier, secretary) and much more likely to enter low-skilled work. In other words, over the past 20 years, workers whose education level was previously regarded as "middle-skilled"—those with at least some secondary education but no tertiary degree—are now more likely to be in low-skilled occupations (OECD, 2020).

Despite this EU-wide trend of labor market polarization, the OECD (2020) also identified exceptional countries such as Germany and Denmark that have counteracted this current. In these two countries, the rise in the share of middle-educated workers in high-skilled occupations has been relatively equal to those countries' growth in low-skilled work. The OECD (2020) attributes these more positive developments to Germany's and Denmark's robust engagement in social dialogue as well as their strong emphasis on VET. Interestingly, as we examine in the individual country briefs appended to this report, these countries have different approaches to VET, yet both have been successful in upskilling middle-educated workers.

VET in Europe is viewed as a key part of the strategy in adapting to the changing nature of work due to technologies and automation. The EU as a whole and the individual countries we looked at in this study have all begun to adapt policy and practice to weather the transitions in national and local labor markets so that learners and workers can skill, upskill, and reskill (Schmit, 2020). Importantly, lifelong learning is a right that is enshrined in the European Pillar of Social Rights (European Commission, n.d.). Both the culture and structure of VET are increasingly being shaped to encompass this right, meaning that they have been developed in ways that at least theoretically allow learners including youth, learners with challenges, and older adults to learn new skills and move along educational and career pathways throughout the life course.

Lessons from EU VET for the United States

In recent years, responding to economic crises and the future of work has been a focus in both policy and practice for the EU as a whole and within our countries of focus. This has led to the development and implementation of several worker-focused practices designed to offer flexibility. In the discussion below we have chosen to prioritize discussion of flexibility-centered strategies that could be useful for technician skilling in the United States. Some of the themes we highlight here are not completely new to the US CTE context but thus far have been implemented differently due to context, policy, and culture.

Educational and Career Pathways

All six of the countries we examined have VET policies that allow for some combination of multiple entry and exit points, dual qualifications (academic and vocational), educational advancement, movement between vocational and academic pathways, and reskilling and upskilling. This flexibility in delivery provides opportunities for education and training for those who may have dropped out of the educational systems or those new to the country's

educational system, such as migrants (Jeon, 2019). Additionally, flexible programming allows students and workers to continue their learning throughout the life course and to enter and exit work and education as needed.

Educational Pathways in VET with Multiple Entry and Exit Points

Early education in the EU context focuses on broad academic skills. All students in our six European countries of focus begin their education in compulsory primary education, which consists of academically focused study. Following primary education, students enter lower secondary education, which is the equivalent of middle school in the U.S. In most countries, students enter the lower secondary level around the age of 12 and finish between the ages of 14 and 16. This period of education is commonly organized around academic coursework but can include some vocational skill development. For example, Austria and Spain allow students to receive a year or two of VET at the lower secondary level. Following this, students enter upper secondary education is optional. Table 1 summarizes the typical age of entry and exit into initial vocational education across the countries.

Country	Typical Age of Entry	Typical Age of Exit
Austria	14	18-19
Denmark	17	18-21
Finland	16-17	19-20
France	15	17-18
Germany	16-17	18-19
Spain	15-16 at lower secondary level; 17 at	18
	upper secondary level	

Table 1: Typical Age of Entry/Exit into Initial Vocational Education

Programs in upper secondary education are often focused on either preparing students for tertiary education and/or employment, so it is at this stage where the bulk of VET occurs in the countries of study. Students typically select a career in their upper secondary education around the age of 16, somewhat earlier than is typical in the U.S., and this involves choosing an academic track or a vocational track. As discussed in more detail below, students are not bound by their original choices, in many cases both systems provide basic education and mechanisms that allow for later movement across programs.

There are three ways in which VET is offered in upper secondary: It is provided in the school system or vocational schools (dual VET), through apprenticeship/work-based learning, or through special programs. In this report we focus on dual VET, as its focus on providing learners with the opportunity to simultaneously earn a labor market credential and progress to tertiary education has made it increasingly popular among both workers and employers (CEDEFOP, n.d.).

Dual VET structures give students the opportunity to do both academic work and VET work, including work-based learning experiences.

These work-based experiences are managed in a variety of ways and include learning done in school simulation labs or onsite at company facilities. The dual VET structures are a part of the upper secondary school systems and will be discussed in more detail below.

Each country's programs offer multiple training options designed for different skills areas and occupations, ranging from carpentry to art, manufacturing, and service occupations. Across the six countries, the duration of upper secondary VET required for a degree or qualification range from one to five years. Learners can then enter post-secondary or tertiary VET programs for more specialized training, including professional baccalaureates and even some combined general education and vocational training master's programs. These higher education programs, which in combination last between one and five years, tend to offer multiple entry and exit points to allow frequent transitions between work and learning. For example, Austria has four separate hybrid VET/general education programs, each ranging from one to five years in duration. Graduates of these hybrid programs are granted the option of participating in a bridging program to enter into one of three 2- to 3-year post-secondary programs for specialization, including a master craftsperson qualification. There is also an option for VET students to enter a pathway to general education after completion of an upper secondary qualifying exam or a post-secondary program.

In Denmark there is one broad upper secondary VET program that lasts about four years, as well as a shorter two-year basic vocational program for struggling or unemployed job seekers and a hybrid four-year program. Completion of any of these programs can lead to a two-year professional program and/or a professional bachelor's program, which can then lead to a general education master's program. Finally, Finland's VET system has one upper secondary program that can lead to a general education bachelor's program, a further VET program, or, at the post-secondary level, a specialist VET program, all of which are flexible in time to completion. These systems are designed to provide clear structures for learners to progress across programs, even at different life stages. These varied structures can be seen in different aspects of the US systems, but there is more uniformity in implementation within each European country than there is in the US.

We often found, built into the clear structure of these VET systems, flexibility mechanisms that allow students to change pathways as circumstances demand. One such mechanism is the ability to move from traditional education to VET and vice versa. Denmark, for example, emphasizes a lifelong learning approach in which students can enter higher education after receiving a dual qualification/degree (VET and general education) or a VET post-secondary degree; conversely, students can transfer from general education to a post-secondary or tertiary VET program. Students can also receive partial qualifications and enter the labor market at various points along the educational pathway, then return to education at a later date to build upon their studies or learn a new skill. Finland's VET system offers flexibility in terms of pathways. Finnish VET qualifications can be met in a myriad of ways: through VET school, apprenticeships, alternative training agreements, or a variety of other experiences and training as long as national program qualifications are met. Full VET qualifications at the upper secondary level can lead to a higher education pathway, and general education can lead to post-secondary and tertiary VET. Students are not required to complete each qualification and can combine them based on their needs in personalized learning plans. These plans are developed for each student by a teacher, guidance counselor, or other VET representative.

Austria and Spain also have VET systems designed to allow students in VET programs to enter general education, as well as to allow students in general education to enter VET at both the upper secondary and post-secondary and tertiary levels. The system in France gives students the ability to transfer from upper secondary general education to post-secondary VET, but it is less flexible than the Austrian and Spanish systems in that it lacks a formalized pathway to go from upper secondary VET to general education until completion of multiple programs at the tertiary level.

The least flexible system we examined is the German VET system. There, it is more difficult for students to change their VET pathway, especially since there are exams that are required for specific competences. The German system has a pronounced delineation in the structures and operation between VET and traditional academic systems that limits transferability, though there are still possible pathways to higher education depending on a student's relevant field of study. Albeit less flexible in transferability than other VET systems, Germany does have a specifically designed transition system for students who are low performing in their VET education and cannot secure a job or an apprenticeship. This system, which is primarily schoolbased and more decentralized than general VET, consists of one-year programs for prevocational, basic vocational, and introductory training, all with the goal of quickly providing students with skills for jobs or apprenticeships. In the US ability to shift and change pathways varies by state, institution, and program.

Dual VET

Dual VET systems are popular in the countries we examined. For example, in Germany, about 70 percent of all VET learners get their training through the dual VET system (CEDEFOP, 2016a). In addition to being popular in the countries of interest, dual VET has been an important focus of EU practice and policy since the Great Recession (Šćepanović & Artiles, 2020). The EU promotes the approach, provides incentives and supports to encourage its use, and helps countries implement apprenticeship and work-based learning into their formal education systems (Šćepanović & Artiles, 2020). Additionally, the promotion of dual VET is explicitly

encouraged as part of the Lisbon Strategy as a key means by which Europe can become a knowledge economy.

Apprenticeship in the U.S.

Like many countries in this report, labor unions in the U.S. have long been involved in vocational training through apprenticeship programs in sectors such as skilled trades. In fact, before the primarily community college-based VET system emerged in the U.S. in the early twentieth century, U.S. labor unions (where they existed) held a de facto monopoly on vocational education provision (Braverman, 1974). However, as union membership has declined over the past four decades, the scale and scope of apprenticeship offerings has become diminished. There are a little over 500,000 active apprentices in the U.S. each year (USDOL, 2021). However, interest in apprenticeships seems to be increasing. Like in Europe, for the most part, quality assurance for apprenticeship program. Recent efforts by the Obama administration provided more grant funding to public-private partnerships for apprenticeship expansion and allowed labor unions to act as private sector partners on behalf of employers. The Trump administration also directed funding to expanded

The dual VET approach is one of the key mechanisms for flexibility in VET pathways (CEDEFOP, 2016a). Students are not siloed into simply learning VET skills, but rather continue to learn academic skills while doing their vocational work. This means that some paths into tertiary or higher education remain open to dual VET students (CEDEFOP, n.d.). The extent to which these pathways are actually used by students, however, varies greatly from country to country (CEDEFOP, 2016a).

Dual VET is also one of the primary methods of responding to changes in the labor market. Literature in the field outlines a variety of benefits of dual training, which include reducing skill mismatches, reducing youth unemployment, improving competitiveness, and facilitating the integration of migrants (European Commission, 2012; Andersen, 2016; O'Reilly et al., 2015; Jeon, 2019; Šćepanović & Artiles, 2020). One oft-cited reason is that this system both requires and provides opportunities for schools to understand labor market needs and, through work-based learning opportunities, can ensure that students are learning the skills needed in the labor market (Scepanović & Artiles, 2020). Because industry participates in the training—by providing on-the-job experience, serving as trainers, and/or consulting on competences and technologies required by employers-dual VET systems are better able to keep up with and respond to fast-paced technological change. Dual VET also provides a viable alternative to typical academic pathways, an important benefit in Europe where there are some concerns about over-qualification and mismatch for jobs (Šćepanović & Artiles, 2020). While both the Lisbon Strategy and the Europe 2020 strategy call for increases in higher education completion rates, the European Commission has noted that there may be too many workers with tertiary degrees working in jobs that do not require them (Andersen, 2016; CEDEFOP, n.d.). Dual VET provides one solution to this challenge. These same conversations about degree completion and labor market need are also happening in the US.

Though the benefits are clear, these systems are complicated to implement. Delivering a successful dual VET model requires collaboration between educational institutions, businesses, and unions (Busemeyer & Trampusch, 2012; Hall & Soskice, 2001; Šćepanović & Artiles, 2020). Countries and regional areas without these partnerships in place, or without adequate infrastructure to support them, will find it difficult to deliver a high-quality dual VET system. For example, in rural areas in Finland, school systems often deliver work-based training components themselves because they have difficulty finding enough spots in local businesses to respond to student demand. Our report on the Spanish system in Appendix E details some other challenges related to regional-level implementation. There are some similar models to this in the US in the form of sector strategies, but these are not uniformly implemented and their influence and impact on education varies. The most like model in the US might be sector strategies but their implementation varies as does the collaboration between partners.

Another challenge inherent in the dual VET model relates to equity. There is some evidence that these programs attract or select high-achieving students and are not serving students of color and students from lower socio-economic backgrounds at the same rate (Šćepanović & Artiles, 2020). These historically disadvantaged students may not be the ones selected by employers for the work-based learning spots (Haasler, 2020; Šćepanović & Artiles, 2020). Finally, another criticism is that this model often results in the provision of generous subsidies to the private sector, which means that they are expensive for the countries implementing them. Moreover, scholars question whether these subsidies are sustainable; since they often come from central European funds, they are subject to change with the whims of European policy priorities (Šćepanović & Artiles, 2020).

Post-Secondary/Tertiary VET

Academic and vocational pathways remain separated at the tertiary level, but there are commonalities in some of the coursework in terms of the theoretical offerings. In the six EU countries we studied, most tertiary VET focus on learners seeking to acquire a higher level of specialization (roughly equivalent to a master level) in their vocational field (CEDEFOP, n.d.). This may be due to the early decision-making on careers noted above. All six countries present students with a range of options in terms of disciplines at the tertiary VET level, but some countries focus more prominently on certain sector pathways than others. Austria, for example, emphasizes its healthcare pathway at this stage (CEDEFOP, n.d.). Entry into tertiary VET generally requires successful completion of upper secondary schooling, but educational institutions may create their own requirements for entry. These requirements might include an exam or evidence of work experience. In some countries, like Finland, there is such great demand for tertiary VET programs that it regularly exceeds the supply, making programs very competitive.

Tertiary courses and programs vary widely. Some are full-time courses leading to a diplomalevel qualification that can take between two and four years. Some countries offer options for shorter skilling opportunities. For instance, Finland has moved toward a modularization of learning outcomes and competences by developing partial awards for single or small collections of VET skills. These are aimed at lifelong learners and incumbent workers, allowing them to gain a quick skill and head back into the labor force or work while learning. This approach has great promise as a mechanism of flexibility and adaptation to the needs of a changing labor force. Of note, while it is theoretically possible for people in tertiary VET to transition to academic pathways, many scholars note that in practice this is not really feasible; for the most part the primary outcome for the majority of tertiary VET graduates is work (CEDEFOP, n.d.).

Adult Education & Retraining

Across the EU, the concept of lifelong learning is enshrined as a right and has become a major emphasis in policymaking around adult education and retraining. Reflective of their social democratic systems, a characteristic of nearly all countries studied is the durable public funding supports for adult learners seeking reskilling and upskilling. This is one of the important differences between the US and European system in terms of access and use.

These supports, which make VET free or accessible with financial assistance, make it easier for learners to acquire new skills at various points in the life course than it is in the US context.

As such, this funding is important not only for the individual learners who receive it, but also for the VET systems' ability to respond to changes in the labor market.

For example, many of the countries in our study provide adult learners with paid education leave they may use to reskill and upskill. In some countries, these supports are enshrined as legal rights for all citizens, helping to reduce the bureaucratic barriers that come with meanstested benefits (Pigeaud et al., 2019). Any constraints to accessing this benefit are typically based on requirements related to a minimum amount of time a worker must spend at their current employer and/or mandates to achieve a specific qualification or credential from their training.

Supports often come in the form of a wage subsidy based on current salary but may come in the form of a low-interest loan (i.e., Germany); such benefits can last for up to two years (Pigeaud et al., 2019; UNESCO, 2019). Some countries, such as France, even provide paid leave for adults to conduct a skills assessment and develop a training plan with an advisor (Pigeaud et al., 2019). Advising and other wraparound services for adult learners are also publicly supported in many countries in this study.

In some countries, employers can apply for public funding to provide their own training or develop a type of public-private partnership with a VET institution. In countries such as Austria and France, particular attention has been given to small- and medium-size enterprises, which are allowed to apply for state funding to identify training needs in their workforces and design coordinated training plans (Pigeaud et al., 2019; Chopra-McGowan & Reddy, 2020). In other countries, private enterprises may work with general adult education providers as well as educational institutions to upskill/reskill their workers (García-Longoria Serrano, 2006). In

countries like Germany, where aging in the workforce has become a prominent policy issue, companies have offered targeted training and support programs toward their older employees (Blau, 2011). Enterprises in countries such as Finland and Austria have taken on significant responsibilities as sites of training delivery (European Commission, 2021; OECD, 2020). Much of the robust public funding described above comes from liberal taxes on enterprises, with a "pay or train" doctrine undergirding how many states approach financing their retraining or upskilling initiatives. This is especially true in countries like France (Schreiber-Barsch, 2015). High union density in most of these countries has also helped produce labor markets in which most workers are covered by collective agreements that include training provisions and supports. In fact, a recent report from the OECD (2019a) found a strong correlation between collective bargaining coverage and the amount of collective training agreements, with upwards of 20 to 30 percent of collective agreements including training provisions in most of the countries included in this study. Trade unions themselves also play significant roles in both provision and policymaking around adult education and reskilling in all countries studied (OECD, 2019a).

All countries in this study had a diverse field of adult education providers, ranging from public institutions, universities, non-profit organizations, private contractors, internal company providers, religious organizations, and folk/popular education systems. In most cases, at least some public funding is provided to training organizations regardless of their relationship to the state. In addition to its role as a funder, the state typically serves as the agenda setter in terms of policy and requirements for providers, often in consultation with social partners. For example, Austria has a national-level quality assurance framework that defines basic standards and requirements that adult education providers must meet to receive public subsidies (Ö-CERT, n.d.). In France, the state works in a collaborative role with local authorities and education institutions to coordinate training provision (Schreiber-Barsch, 2015).

All countries in this study have long histories with popular notions of education that have informed a generalized recognition that opportunities for lifelong learning should be widely available, low-cost/free, provide individual enlightenment, and contribute to broader social goals of developing an informed and engaged democratic citizenry. Under this conceptualization of education, learning is as much a tool for collective emancipation as it is for individual development. Folk high schools with this mission are very common in Nordic countries as well as in Germany and Austria, and their curricula will often include opportunities for vocational education and training that can co-occur with other learning opportunities geared toward a learner's self-actualization needs (European Commission, 2021; German Adult Education, n.d.). In addition to nationwide networks of community-rooted, popular education institutions, countries like Spain, France, and Denmark also offer full access to a regular VET system for adult learners (Sancha & Gutiérrez Dewar, 2019; Schreiber-Barsch, 2015; Dibbern, 2020) In fact, it is becoming increasingly common for post-secondary institutions in countries like Denmark to oversee both the mainstream and adult education systems, allowing for a lot of cross-permeability and a more diverse range of options for adults to reskill (Dibbern, 2020).

The democratic-emancipatory model for adult education exemplified in folk/popular education has allowed many adults to reskill within a more liberal education setting than in a traditional workforce development context. Yet, this connection to broader social goals is becoming less central to the policy agenda in many countries. Faced with more unstable labor markets and larger crises within social democratic systems, these programs are becoming more oriented around market-based neoliberal logics (Rasmussen et al., 2019). While this may help some workers survive the more volatile swings in the labor market, the mission of education as emancipation may be less central to the process.

Special Programs

Also emphasized in EU VET are provisions to accommodate students who may struggle academically or have special needs. These populations have become a growing concern in the discussion over decent jobs for workers of the future, especially given the negative labor market effects on these groups due to the recent pandemic (Schur et al., 2021). For example, Denmark's focus on lifelong and individualized learning involves free VET opportunities for adult learners and emphasizes providing VET to weaker learners. Struggling students can enter a short basic school- and work-based program that can be transferred to a main VET program or lead directly to the labor market. Alternately, students can attend an exam-free school of production program that focuses on practical skills and provides active guidance to career path options. The law also requires a specially designed upper secondary VET program for students with special needs that incorporates vocational, practical, and general education components in coordination with parents, students, and guidance services (Andersen & Helms, 2019). Austria offers an alternative pathway for upper secondary students that need extra time or greater individualized assistance for a dual qualification through its Vocational Training Assistance Service (Tritscher-Archan, 2016). Spain has an alternative, shorter basic VET program that can start at the lower secondary level and lead to a qualification for the labor market or to further education and, subsequently, to the main VET program (Sancha & Gutiérrez Dewar, 2019).

Qualifications

In most countries, including Germany, the state develops and standardizes VET qualifications in unison with other social partners like employers and union associations. However, some larger German employers with sufficient resources and training abilities also offer their own private certificates that are largely recognized by industry, allowing for another flexible option to German VET seekers. The normal repository for this kind of standardization is a National Qualifications Framework (NQF), one of which is present (or at least in the process of development and implementation) in all countries studied. These frameworks communicate the content and profile of the country's labor market qualifications—the expected knowledge and ability of anyone who holds the qualification. In line with the standard throughout the EU, countries in this report classify qualifications in eight stacked levels that are based on learning

U.S. VET Qualification Frameworks & Recognition of Prior Learning

Recent analysis has found that nearly a third of U.S. adults hold some form of non-degree credential (Cronen, et al., 2018). However, most of these credentials are awarded, assessed, and transferred on an institutionby-institution basis. Importantly, while recent efforts have highlighted the critical need for greater alignment on uniform standards for credential quality (Van Noy, et al., 2019), there are currently no mechanisms or systems to help U.S. workers, employers, policymakers, and educational institutions to define or measure the quality of credentials awarded outside of traditional vocational and academic education systems (Connecting Credentials, 2015). In addition, while most U.S. higher education institutions, particularly community colleges, have had long-standing policies on the recognition of prior learning acquired in non-school settings, these policies are again defined primarily at the institution or system level (Garcia & Leibrandt, 2020). The U.S. VET system could potentially learn a lot from how the states in these reports have designed and implemented their NQFs in order to encourage greater alignment and transferability of non-degree credentials and open up more pathways to VET qualifications beyond traditional community college structures.

outcomes. However, it is important to emphasize that the mere existence of an NQF in a given country does not automatically imply that the framework has strong regulatory functions or any legal effect on the VET system. For example, although Austria's NQF is used to guide the development of new qualifications, but is being primarily used to promote transparency for learners; not redesigning policy. (CEDEFOP, 2020).

The catalyst for the development for these frameworks has been the EU-driven European Qualifications Framework (EQF), which was formally established in 2008 and serves as the standard eight-level model for the NQFs subsequently developed by the countries in this report (Méhaut & Winch, 2012). Of the countries in this study, Austria, Finland, France, and Germany have formally linked their NQFs to the EQF, allowing for at least some portability of qualifications across borders within the EU (CEDEFOP, 2020). Moreover, the scope of NQFs in most countries studied cover both the general and VET systems, as well as training delivered outside of formal systems. This often means that an individual qualification can be achieved through a variety of education pathways, not singularly through formal VET education (CEDEFOP, 2020). The US lacks a system like this for non-degree workforce credentials and thus their value and role in the labor market is difficult to understand and translate to learners, employers, and other stakeholders.

The stackable structure of NQFs has encouraged (and, arguably, necessitated) the modularization of qualifications in many countries studied, although there is variance in how much modularization is emphasized and supported. For example, because both trade unions and many employers in Germany have a strong cultural attachment to the holistic nature that has historically been at the core of the German dual system, they tend to view moves toward modularization as a fundamental disruption to the social, political, and individual objectives of VET education in that country (Deissinger, 2019).

In contrast, in France, a more enthusiastic embrace of modularization has been present. Since 2014, the country has been advancing the notion of blocks of competences (*blocs de compétences*) in which competences within qualifications are organized based on socially meaningful activities and labor market applicability. France is also a good example of a country that has linked stackable and partial qualifications to its robust system of validating non-formal and informal learning, described more below and in the Appendix B. All qualifications in the country's NQF can be acquired through validation and are required to have a validation procedure specified. Finland's NQF also includes competence modules that are defined in learning outcomes and are comparable with qualifications (Pigeaud et al., 2019).

NQFs themselves can also be vehicles for administrative collaboration between the state, enterprises, worker representatives, and social partners. The development, maintenance, and quality assurance of these systems are usually conducted through cooperative arrangements at both the local and national level, with the state often serving as a basis for the institutionalization of these partnerships. Tripartite committees comprised of state, employer, and worker representatives are common in this regard, although the level of actual power that each social partner holds within these governing bodies varies somewhat across countries.

Skills

Many of the countries in this study are highly adept at identifying labor market skill needs as well as adapting qualifications and curricula as those needs shift. Skill anticipation activities are core parts of VET system governance in many countries studied. These involve leveraging what are typically collaborative research and monitoring institutions (sometimes required to be present in each industry) between state, labor, and private organizations to better understand labor market skill demands and adapt training programs as needed. For example, France is home to industry-based skills operators committees, which are collective bodies that use research capabilities to help anticipate training needs in industries and implement transition projects for workers through the use of personal training accounts and other funding schemes (Pigeaud et al., 2019).

Partnership between worker organizations, state, and industry in curriculum development is another mechanism by which skill needs are anticipated and addressed. In France, for example, vocational advisory committees (CPCs) are integral to the development of VET qualifications and are comprised of employers, trade unions, trainers, and state representatives. They are divided at the sector level and help to define VET qualifications based on the training needs of their respective labor markets (Pigeaud et al., 2019). There are also joint employment and vocational training committees in each industry made up of employer and trade union representatives that conduct research to identify training priorities and make requests for new qualifications to be added to the NQF as new skill needs arise.

Professional development of VET teachers is also a significant way in which vocational skills are kept current and relevant to labor market imperatives.

In Finland, for example, pedagogical training is updated continuously by vocational teacher education colleges, which is one way that VET competences and qualifications are kept up to date. Finland is also an example of a country in which VET teachers are encouraged to participate in professional development in real-world workplaces. This has multiple benefits. Teachers stay up to date on new technology and practices while both helping to enhance cooperation and collaboration between the education and business sectors and generating opportunities for work-based learning and employment for students (CEDEFOP, 2019; Finnish National Agency for Education, 2019).

Modularization

Modularization of VET qualifications has been an EU imperative as well as an adaptation to more rapid shifts in labor market skill needs.

This provides flexibility in reskilling and upskilling, often allows workers to validate their skills outside of formal training programs and gives students the opportunity to acquire partial and/or finite skills. In Finland, for example, VET qualifications have been based on modules and competence units for nearly three decades, and the Finnish VET system is broadly structured by

individualization and choice in a learner's education pathway. Individual modules within a qualification can be assessed and certified separately and at various points in a training program, rather than solely through a final assessment, and learners can move in and out of training programs prior to their final assessment. Denmark's VET system is also heavily modularized, and there is no requirement for learners to complete modules in a specified order. Partial qualifications, known as *trin* in Denmark, can also be awarded to learners, although some trade unions and employers have raised concerns about the quality and value of these credentials (CEDEFOP, 2015a).

It is important to note, however, that in some countries studied, particularly in Germany and Austria, there is still a tension between module-based training programs and ones that are more explicitly aimed at developing a learner's occupational identity—or *Berufskonzept*, to use both

U.S. VET Modularization

While many countries in this report have moved to modularize existing VET qualifications and credentials, in the U.S., modularization is less common. Unlike countries such as Finland or Denmark, where a worker could theoretically acquire a partial qualification through an apprenticeship or other form of work-based training, recent analysis has shown that U.S. employers are unlikely to provide supplemental work-based training opportunities. As described earlier, without a more centralized system like an NQF, modularized U.S. credentials will continue to struggle with portability as well as having their value broadly recognized on the labor market (Cappelli, 2015).

the German and Austrian terminology. Moreover, even where modularization is present in training programs, content usually must be progressed through in a specified order, and full qualifications are still awarded only if a learner has completed the entire training curriculum. In other words, while blocks of competences may be part of a larger training curriculum, in these contexts, they typically cannot be separately assessed and validated outside of some specific pilot modularization programs (CEDEFOP, 2015a).

Recognition of Prior Learning

Flexibility in VET also emerges in the recognition of prior learning through assessments. The opportunity to demonstrate learning can save students time and money towards VET qualifications. It also contributes to lifelong learning opportunities for workers reskilling or upskilling. Recognized learning can typically include work experience, volunteer/community service, and other experience. In many cases, the recognition of prior learning is enshrined as a right for all citizens, and the process often occurs in a more centralized manner outside of individual institutional frameworks. For example, in France, the validation of prior learning occurs through a jury review. In addition, recognition of prior learning also serves as the basis for developing training plans and informing other services, such as guidance. In some countries, workers may be able to achieve a full qualification without having to attend any additional training. This, of course, speeds up the reskilling process, but the modular design of NQFs also broadens the domains in which training can be legitimately delivered in the sense that adults receiving training through adult education centers, in-company programming, or other informal learning sites can have that learning validated and seen as equivalent to training delivered at a VET or post-secondary institution. In the US, prior learning assessments often exist as policy in community colleges and other institutions of higher education, but in practice use is often low. A recent study in Colorado found that after implementation of a new prior learning assessment policy just under 4 percent of students in the Colorado Community College System received prior learning credit (McKay & M, 2019).

VET Curriculum, Policy, and Updates

VET Governance in the U.S.: Workforce Development Boards

As described in the paper, the "tripartite" governance structure for VET is common in Europe. In the U.S. one of the governance structures for adult vocational education system are state and local workforce development boards, which are sanctioned in law by the Workforce Innovation and Opportunity Act (WIOA) – the largest federal funding source for job training (Workforce Innovation and Opportunity Act, 2014). Importantly, while most countries in this report have rapidly scaled funding for vocational education as a proportion of national GDP, federal funding for WIOA has declined by nearly half since 2001 (National Skills Coalition, 2017). Moreover, unlike the fairly equal weight given to state, employer, and worker representatives in VET administration in the EU, the WIOA requires that state and local workforce development boards be employer-led, meaning that business representatives must make up at least 50 percent of the membership on these boards. The law requires that only 20 percent of these boards be comprised of worker representatives (Workforce Innovation and Opportunity Act, 2014). Some exceptions to this rule would be the state of Washington, which has operated its state workforce board in a tripartite structure since 1991 (Lam, 2019). Despite this unequal make-up in many states, state and local workforce development boards have been key vehicles for the implementation of sectoral training strategies in a variety of regions, particularly in the context of TAACCCT grants (McKay et al., 2013).

Curriculum development and adaptation is another way that EU VET works to respond to changes in the labor market.

There is some flexibility in teaching and possibilities for adaption within classrooms, institutions, and in regional areas. Additionally, work-based learning components of curricula serve as a way for students to get skilled on new technologies in the field. This is especially true when the work-based learning components of the curriculum are able to be offered in industry and with trainers from the field.

As noted above, European VET systems involve various partners including schools, training providers, employers, government agencies, and labor unions. These groups work together to fund, provide, monitor, and certify training. They also collaborate to develop and standardize VET curriculum. In some countries, like in Finland, Denmark, and Germany, the federal ministry of education is primarily responsible for this development and coordination with the social partners, whereas in others, like Spain and France, this role is shared by both the ministries of labor and education. Despite national curriculum standards, in all countries there is some level of regional authority and flexibility provided to individual territories to administer VET and thus shape curriculum. For example, in Germany, the federal government is responsible for in-company training and apprenticeships, while the local authorities administer school-based learning (Hippach-Schneider & Huismann, 2019). Employers are heavily involved at both levels. In Denmark, local VET plans are implemented in each region

based on national standards, but these plans are adapted with suggestions made by local governments, trade committees, and schools that administer VET.

A key aspect of flexibility in VET for adaptation to the changing nature of work is the ability to shape and change curriculum as needed.

All six of the EU countries in this study have some form of coordination at a national level between the state government, employers, labor, and other social partners to develop, implement, and change VET curriculum. Looking at VET curriculum development and implementation can help highlight effective policies and practices, how they are structured, and how they may have changed in the past decade to meet the challenges of globalization and technology. Further, as the U.S. lacks both comprehensive and generalized national VET curriculums as well as significant modularization provisions, these examples provide lessons and potential opportunities for US VET development at the federal, state, and local levels.

In France, the federal government develops curriculum, standards, exam qualifications, and quality assurance in consultation with business partners, while regional governments plan and define policies based on local needs determined in collaboration with social partners (Pigeaud et al., 2019). In Denmark, local VET plans are implemented in each region based on national standards, but they adapted with suggestions made by an advisory council made up of social partners and similarly organized local committees, as well as by teachers, trainers, school boards, and managers that control schools and administer VET (Andersen & Helms, 2019). Similarly, according to our interviewees from the Basque region of Spain, qualification standards in that country are centrally developed by social partners and are nationally recognized in the labor market. Smaller employers may still encourage and support Spain's school-based VET system locally, however, because they typically lack resources to offer apprenticeship programs that other firms in larger countries might have.

Delivery

The six VET systems we examined can also be categorized by how VET curriculum is implemented. For example, is curriculum delivered primarily by a state-run school, by an employer, or, as is most often the case, some form of both (see the first column in Table 2). These categories help to characterize the roles in the system of different social partners and the way these partners influence delivery. In particular, we focus on the role employers play, as their involvement in the process can help to promote the teaching and delivery of pertinent skills for the labor market. Still, it must be noted that although each country in this study has a VET system that offers apprenticeships, some may not be considered a pure collectivist skill formation system under this categorization, especially since apprenticeships may not always be available.

The German dual system, which is the most popular and commonly referenced VET apprenticeship model in Europe (Graf & Powell, 2017), is the main example used for collective

skill formation (Busemeyer & Trampusch, 2012). As characteristic of collectivist VET, German employers have a significant influence in VET curriculum and administration. This is part of the reason why apprenticeships are common and why the VET experts in Germany felt that apprenticeship qualifications were often valued more highly by employers than qualifications granted through VET schools. Austria's dual system also features apprenticeships and is characterized as having a collectivist skill formation system. VET there is still considered primarily school-based, however, mainly due to larger employers choosing more often not to provide apprenticeships and to favor school-based training instead (Busemeyer & Trampusch, 2012). Similarly, Denmark's VET is primarily school-based, but it is still considered to have a collectivist skill formation system (Busemeyer & Trampusch, 2012). The Danish system offers more training flexibility to firms and other VET institutions, and there is generally some form of paid apprenticeship function for every VET program offered. Students must first receive foundational education; then they can receive hands-on-training at the upper secondary level in the form of an apprenticeship (CEDEFOP, 2019).

Spain's VET is a statist system. Apprenticeships are available but not compulsory, and most VET is administered by schools, albeit with strong coordination with employers and input by unions, according to our expert interviewees. Nonetheless, there are work-based-learning components in main VET program curriculum at the upper secondary level and even as part of an early-stage VET program that begins at the lower secondary level. For example, many VET schools feature equipment and laboratories that reflect real workplace environments and are staffed by skilled teachers (Sancha & Gutiérrez Dewar, 2019). Like Spain, France has a strong state-driven VET and skill formation system (Busemeyer and Trampusch, 2012). Although primarily delivered by schools, French VET offers apprenticeships that lead to the same curriculum qualifications issues by VET schools. They are offered through dedicated apprenticeship training centers that coordinate the arrangements between students and employers.

As noted above:

the balance between schools and employers helps provide flexibility for the worker, as does the association with the school system.

When done well, this can present learners with opportunities for mobility and pathway changes.

Due to the liberal attributes of the U.S., such as the primacy of market relations, the disincentive for firms to invest in general skills that can be used in competing firms, and the similar risk aversion of employees to invest in specific skills for a particular employer that can limit their employment opportunities (Estevez-Abe et al., 2001), the U.S. is unlikely to shift toward a purely collectivist or statist VET system. However, this does not negate the ability of employers to engage with policymakers, community colleges, and other VET stakeholders on curriculum development, which they would directly benefit from.

Development and Implementation				
	Primary Approach to VET	Skill Formation System ¹		
Development and				
Implementation				
Germany	Dual System (Employer-based)	Collectivist		
Austria	Dual System (School-based)	Collectivist		
Denmark	Dual System (School-Based)	Collectivist		
Finland	Flexible State/School System	Statist		
Spain	State/School System	Statist		
France	State/School System	Statist		

Table 2: Skill Formation System Classification (Busemeyer & Trampusch, 2012) of the VETSystems of Six European Countries Based on Their Primary Approach to CurriculumDevelopment and Implementation

¹See page 4 for a discussion of Busemeyer and Trampusch's (2012) categories

VET Teaching, Teacher Training, and Professional Development

In the EU countries in this study;

VET teaching is generally paid well, requires continuous education and training, is culturally respected as an important part of the economy and national consciousness, has opportunities for professional development, and may allow for flexibility to innovate and adapt to changing technologies.

In Finland for example, teaching at the secondary level, especially in VET, requires an appropriate higher-education degree with pedagogical studies and a minimum three years' work experience, and is a highly sought after and well-paid occupation offering autonomy and continuous training (CEDEFOP, 2019; Finnish National Agency for Education, 2019). Conversely, in the U.S., K-12 public education teachers need a bachelor's or master's degree to qualify to take an initial teaching licensure exam, which they must pass (the particular exam and requirements vary by state [Broderick, 2021]), but teachers are often neither paid nor valued in the same way their European counterparts are. In fact, in the U.S., there is a 20 percent pay penalty when teacher salaries are compared with those of non-teacher college graduates with similar characteristics and experience (Allegretto and Mishel, 2020).

VET teachers' involvement in a variety of components in the VET system gives them a vital role in shaping learning for students and keeping curriculum up to date. They are generally considered major stakeholders in the curriculum development process, working closely with the state and social partners in most countries studied. For example, in Denmark, VET teachers, teacher unions, and other VET stakeholders are represented on a national advisory council that develops standardized curriculum, and they are represented at the local level on VET bodies that make decisions on and administer VET curricular reforms (CEDEFOP, 2012). Similarly, in Austria, where schools are allowed to be flexible in adapting their curriculum to focus on certain areas to meet regional economic needs, VET teachers are key components in the curriculum development process (CEDEFOP, 2015ca). VET teachers are also typically involved in the design and implementation of individual learning plans for students as part of dual or apprenticeship systems. For example, every VET program in Finland is individualized for students, and teachers are involved in the development of individual programs of study. Teachers may also work with representatives from industry in the development of these plans (CEDEFOP, 2019).

Teachers are also expected to participate in some form of professional development, which in some cases, like in Finland, professional development can include time working in industry.

These opportunities help teachers maintain good relationships with local business while keeping their skills up to date.

VET Funding

Most VET in the EU, at all levels, is publicly funded.

There may be variance across which bodies allocate funding and disperse it: For example, numerous federal and local government bodies as well as employers, unions, and their respective associations and chambers contribute to VET (Hippach-Schneider & Huismann, 2019). This wide variety of funding streams mean that VET is generally free of charge to students in lower and (if available) upper secondary VET programs and in many cases is no or low cost for tertiary and adult education as well. This funding reality makes initial and continuing VET training more accessible to students and workers in the EU than it is under the US CTE system. The fact that community colleges remain the primary site of vocational training provision in the U.S. means that, without scholarships or other forms of financial aid, many U.S. VET students incur fairly significant direct and indirect training costs.

VET Financing in the US: New Jersey as an Example

While we have previously noted that the US VET system often incurs significant out-ofpocket costs on its users, there are some more local level examples of different regions replicating EU models of VET financing. In 1992, New Jersey created a Workforce Development Partnership Fund, which provides training grants to dislocated and disadvantaged workers as well as employer-provided training for incumbent workers. Unlike France, which places the funding burden primarily on employers, the New Jersey fund is supported by small joint payroll contributions from workers and employers (Fair, 1999). However, the New Jersey fund is far from universal and only accessible to a small number of workers that qualify. This fund does underscore that tax policy could potentially be shifted to encourage more employer responsibility in VET financing as well as provide greater economic incentives in VET recruitment.

Across the six countries in this study, initial or primary VET is free to students through state funding.

In Finland, VET at all levels is publicly funded through taxes and is free to students. Even when employers take on apprentices, compensation is provided by the VET provider to employers to cover the cost of workplace training. State-based VET in France gives all workers who wish to continue training the right to access 20 hours of personal training per year within a personal training account (Pigeaud et al., 2019). Private sector workers are eligible for training leaves of up to one year or 1,200 hours to enroll in part-time training programs from VET providers, which is funded by an education tax on employers that equates to 80 percent or more of the workers' salary (Schreiber-Barsch, 2015). Since 2019, these employees are also entitled to personal training support in the form of 500 euros per year over the course of 10 years, with even more for employees with low qualifications, for the purpose of enrolling in career transition programs. Some of this training is funded by employers who are then reimbursed by the state (Pigeaud et al., 2019). Overall, the French VET system draws on various funding sources depending on the program: Continuing VET is primarily funded by taxes on employers, though the regions and state contribute a significant amount of their own funding, while individual students also pay a small share (less than 6% of total expenditures as of 2015) (Pigeaud et al., 2019).

Industry Upskilling/Retraining Examples

U.S. Union-Management Training Partnerships

The European examples here are just a sample of what are very common union-management training partnerships throughout the EU, which are often encouraged by the very administrative structure of European VET systems themselves. Union-management training partnerships are not entirely absent in the U.S., but they are almost always negotiated at the level of individual employers and unions, limiting their scope and impact. Despite these limitations, throughout the 1990s and early 2000s culinary union locals in the Hotel Employees and Restaurant Employees International Union (HERE) were instrumental in negotiating training programs and union-run training academies for both prospective and incumbent workers to help provide relevant industry skills as well as broader transversal vocational education that could assist workers in upgrading. Some of these were even established at a regional level through negotiations with multiple hotel employers (Waddoups, 2002). Similar training funds have also been won by unions in the healthcare sector, such as the District 1199C Training & Upgrading Fund, which also organizes its own training courses for healthcare workers (Takahashi & Meléndez, 2004).

Manufacturing (Germany, Denmark)

In Germany, trade unions and employers in manufacturing industries have negotiated several sector-level agreements that regulate financial incentives and educational leave for continuing education and training. These are typically based on sector-specific training needs in

anticipation of market shifts. Collective agreements in the metal and electrical industries provide workers with the right to take part- and full-time education leave for up to seven years. Additionally, many of these agreements provide educational accounts (*Bildungskonten*), which allow workers to accrue funds toward educational leave. Collective agreements in the chemical industry also include provisions to build capacity for personnel planning and career guidance in firms (OECD, 2021a). Examples of employer-supported training schemes include German chemical corporation BASF's Generations@Work initiative, which targets older adult workers with lifelong training programs as well as other wraparound services such as career guidance, health maintenance, and ergonomic support (Blau, 2011).

It is important to keep in mind that both union and collective bargaining coverage is uneven in Germany, which has the lowest percentage of collective bargaining coverage of the countries in this report (OECD, 2021b). This means that not all workers benefit from the agreements described above, and workers who are low-skilled and/or at the bottom of the wage scale are particularly unlikely to benefit.

In Denmark, *CO-Industri* (the Danish industrial trade union representing nearly all industrial workers) and *Dansk Industri* (the Danish industrial employer association) negotiated a collective agreement in 2007 that created an industry competence development fund (*Industriens Kompetencefonden*). Under this agreement, all companies in the manufacturing sector are required to contribute a fixed amount per employee that helps cover the cost of a two-week paid training leave for workers in these industries each year. Combining this funding with state unemployment benefits, workers have the cost of their training fully covered and receive 85 percent of their lost wages for the duration of their training. Travel costs can also be covered depending on the length of travel required (CEDEFOP, 2009).

The rationale behind this agreement was to allow workers the opportunity to make more proactive training decisions and provide more flexibility in their continuing education and training pathways. Traditionally, worker training activities in Denmark have been negotiated between workers and their managers. Under this agreement, workers can train in competences of their own choosing and gain necessary skills before transferring to another industry (CEDEFOP, 2009).

Danish sectoral training funds like the one described above are very common throughout the country. However, the heavily state-funded continuing VET (CVET) sector reduces the need for direct private financing through collective agreements between unions and employers. Experts underscore that the true utility of sectoral training funds in Denmark is their ability to bring labor and management closely together to address CVET issues. Most of these funds are, like the *CO-Industri/Dansk Industri* agreement, overseen by bipartite committees of workers and employers. Members of these committees typically collaborate on developing pilot courses and research projects on skill needs, and they work together to reform CVET courses to meet current labor market conditions. Some training funds engage in more systematic training planning

within enterprises in their respective industry. These activities usually spark feedback processes that help influence and shape public CVET sector programming (CEDEFOP, 2009).

Information and Communication Technology (Spain)

In Spain, the trade union UGT (*Unión General de Trabajadores*) and Ametic, the ICT (information and communication technologies) employer association, recently finalized an agreement that stipulates that if jobs in the ICT sector are destroyed or transformed due to the introduction of new technologies, actions will be taken to identify new options for job creation. Moreover, relevant social partners in the Spanish ICT sector have signed a manifesto for digital talent that highlights the need to improve education and training to promote digital upskilling, adapt to new technologies, and increase the gender ratio of the sector's workforce (UNI Global Union, 2019).

UGT has also signed an agreement with Google that stipulates that the company will train 200 trade union members, free of charge, in transversal digital skills. Upon completion of the training, these workers will become trainers themselves and train an additional 5,000 workers in various sectors through an online training platform (UNI Global Union, 2019). As part of the agreement, Google has agreed not to collect any personal data on participants, an issue that has become a particular concern for many worker representatives in the ICT sector across the EU as workplace technologies gain more surveillance capabilities (UNI Global Union, 2019).

Biotechnology (France)

In 2020, the French biotechnology sector announced a first-of-its-kind training platform called the Campus Biotech Digital. Financed through a public-private partnership and led by large companies in the field, training organizations, digital companies, biotech equipment manufacturers, and small- and medium-sized enterprises, the online campus is aimed at upskilling workers in the field to meet new technological challenges (bioMérieux, 2020).

According to bioMérieux, a biotech diagnostics company that helps form the backbone of the initiative, the French biotech sector is expected to create thousands of new jobs within the next decade. This surge in new positions will likely create a skill shortage that Campus Biotech Digital is attempting to counteract. Training programs will encompass the entire production chain in the sector, leveraging new learning technologies such as augmented/immersive reality and AI cognitive learning approaches to upskill workers in emergent processes and professional practices as workplaces in the industry change. Programs will be targeted to both current and incumbent workers (bioMérieux, 2020).

Conclusion

European VET systems provide insight and tools that could be helpful in the development of national, state, regional, and institutional policy and practice of US CTE. While there are some key differences in country structures between the U.S. and the EU that make total replication of

any of the VET systems outlined here impossible, the activities to create a structured yet flexible approach to VET that Europe undertook after the Great Recession have great value when it comes to thinking about how the U.S. can respond to labor market crises. This is especially important now. Economic crises beget moves toward change, and in the post-pandemic recovery, shifts in CTE practice and policy in the U.S. may be more possible and necessary than ever before. In many cases, the strategies outlined in this report are already being used in the U.S., but they are not implemented in the same ways or are not as clearly outlined in policy. In other cases, such as financing CTE, the U.S. is in a more nascent stage. The common thread we found across VET systems in all the EU countries we studied was a move toward flexibility, and as such, we believe that to be the most important lesson to carry over to the US CTE system. Below we identify themes that emerged in our work that could be useful considerations for inserting and/or centralizing flexibility into US CTE policy and practice.

- **Multiple Entry and Exit Points**: A flexible VET system has opportunities for learners to move between work and employment. Learners must be able to exit and enter the system as needed to acquire skills and credentials.
- Educational Pathways: A flexible VET system allows movement between pathways from academic coursework to VET. It also has opportunities for educational progression.
- **Recognition of Non-Institutional Learning**: A flexible VET system allows learners to demonstrate and document prior learning and knowledge.
- **Curriculum**: A flexible VET system both allows for and encourages adaptations to curriculum to meet labor market needs. In some cases, these adaptations could be localized to respond to area needs.
- **Modularization**: A flexible VET system enables learners to receive formal acknowledgement for the acquisition of individual skills or skill sets through a modularized curriculum.
- Work-based Learning: A flexible VET system includes opportunities for work-based learning so that students can learn skills needed in industry and find pathways to employment.
- **Teacher Training and Professional Development**: A flexible VET system provides opportunities for teachers to learn new things and, in the best instances, learn from industry to help them shape the learning experience to respond to labor market needs.
- **VET Financing**: A flexible VET system provides low or no cost training to learners to make skills development and enhancement accessible to all potential learners. It also takes into account other indirect costs incurred during training such as transportation, childcare, and guidance.
- **Shared Governance:** A flexible VET system is based on shared responsibility between workers, employers, and the state, with all actors holding relatively equal weight in the administration, governance, and design of VET systems.

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Appendices

Appendix A – Germany Country Brief

James Boyle, Heather McKay, Justin Vinton

1. Introduction

This section will provide an overview of Germany's Vocational Education and Training (VET) system. The Constitutional Law of 1949 has enshrined responsibility for the German education system to the Federal States (Länder), while the regulation of in-company training is overseen by the federal government, primarily through the Federal Ministry of Education and Research. This legal foundation has produced an institutional context for VET governance that requires close collaboration between the federal government and Federal States as well as employers and trade unions. VET regulation is always created with social partners (Hippach-Schneider & Huismann, 2016; 2019; Hippach-Schneider, Krause, & Woll, 2007).

Overall, the German VET system is characterized by use of the dual system that combines apprenticeship and school-based learning, along with a high degree of layering of VET qualifications (Hippach-Schneider & Huismann, 2016; 2019; Hippach-Schneider, Krause, & Woll, 2007). Despite this layering and use of clear pathways that advance up through the postsecondary education levels, much of the German system remains based on a very traditional notion of "vocation" that minimizes the importance of more modern imperatives that call for modularization and advancement beyond linear pathways. This adherence to traditional modeling also contributes to fairly rigid teaching standards based on pre-established curriculum and learning outcomes defined primarily at the national level (Hippach-Schneider & Huismann, 2016; 2019; Hippach-Schneider, Krause, & Woll, 2007). Standardized exam and competency requirements also make it difficult for students to change the direction of VET education from a skill set designed for a one occupation to another. Although there is a shared core curriculum across disciplines, there is very little flexibility once a student is on a specific path in VET.

Given Germany's ageing workforce, adult reskilling is an important policy objective undertaken by both private and public sector entities. The strong cultural attachment to the dual VET system has produced a variety of recruitment mechanisms through both public- and employersponsored subsidies as well as various guidance mechanisms. Curriculum development is fairly standardized, in consultation with social partners, and reflects the historic aims of Germany's holistic approach to VET (Hippach-Schneider & Huismann, 2016; 2019; Hippach-Schneider, Krause, & Woll, 2007).

2. Structure

2.1 Education and Career Pathways

VET provision in Germany exists at the upper secondary, post-secondary, and tertiary education levels. German students enter full time education at age 6 and remain enrolled for 9 or 10 years, depending on the state (Hippach-Schneider & Huismann, 2016; 2019; HippachSchneider, Krause, & Woll, 2007). Students who complete this phase of education and do not enroll in a traditional full-time postsecondary program (e.g., a degree-granting university) are required to attend a part-time vocational school for three years. In line with ISCED classification, students are generally between the ages of 15 and 16 when they enter an upper secondary VET program, and around 17 or 18 when they finish (Hippach-Schneider & Huismann, 2016; 2019; Hippach-Schneider, Krause, & Woll, 2007). However, informants at the ground level in Germany noted that some students may actually start at age 18 and finish at age 21 or above.

At the upper secondary level, the major education pathways are school-based VET and dual VET (apprenticeship). In line with the governance divisions described above, school-based VET is regulated and financed by the federal states, content is stipulated in a skeleton curriculum, and programs are monitored by a school inspectorate (Hippach-Schneider & Huismann, 2016; 2019; Hippach-Schneider, Krause, & Woll, 2007). In contrast, apprenticeship/work-based training is regulated by the federal government via content stipulated in training regulations. Programs are financed by training companies and monitored by competent bodies (chambers of industry, commerce, and/or skilled crafts) (Hippach-Schneider & Huismann, 2016; 2019; Hippach-Schneider, Krause, & Woll, 2007). Students can advance from either pathway to various post-secondary and tertiary VET programs (Hippach-Schneider & Huismann, 2016; 2019; Hippach-Schneider, Krause, & Woll, 2007). The characteristics of each major pathway are described below.

2.1.1 School-Based VET

School-based VET involves both training and work-based learning. Training is conducted within full-time vocational schools (Berufsfachschule), and work-based learning opportunities are offered through traineeships (Hippach-Schneider & Huismann, 2016; 2019; Hippach-Schneider, Krause, & Woll, 2007). These programs typically last one to three years and can offer vocational qualifications, or student attendance can be credited as the first year of training in the dual system. In these settings, full qualifications can generally be acquired in the care, commercial, and health sectors. Through successful completion of a school-based VET program, learners can also earn a higher education entrance requirement (Hippach-Schneider & Huismann, 2016; 2019; Hippach-Schneider, Krause, & Woll, 2007)

2.1.2 Dual VET (Apprenticeship)

Apprenticeship programs are the main pillar of the German VET system and typically last from two to three-and-a-half years (Hippach-Schneider & Huismann, 2016; 2019; Hippach-Schneider, Krause, & Woll, 2007). In these programs, training takes place in two learning venues: vocational schools and companies, who take on some of the cost of training and pay apprentices a nationally standardized wage that contractually increases after each year of training. In general, between 50 to 75 percent of a student's time is spent at in-company training in the dual system (Kuczera, 2011).

Vocational schools provide general education, theory, and practical knowledge in subjects like economics, foreign language, and social studies, while companies fulfill process-oriented training based on enterprise-specific requirements (Hippach-Schneider & Huismann, 2016; 2019; Hippach-Schneider, Krause, & Woll, 2007). Time is split between the two learning venues either by days of the week or in blocks in which students will attend vocational school for a certain number of weeks per month and spend the rest of their time at their apprenticeship site. Small and medium size employers are important apprenticeship providers given their wide proliferation throughout Germany, and they are often supported through public subsidies in order to have the capacity to effectively train apprentices. These include publicly supported inter-company vocational training centers as well as training consortiums and associations at the sectoral level (Hippach-Schneider & Huismann, 2016; 2019; Hippach-Schneider, Krause, & Woll, 2007).

As stated above, the dual system for VET is administered between specialized VET schools and companies across various industries that offer these formal and paid apprenticeships (HippachSchneider & Huismann, 2016; 2019; Hippach-Schneider, Krause, & Woll, 2007). Enrollment involves a specialized contract between an employer and a student that is supported by a VET school.

In both the school-based and work-based portions of the dual system, qualifications are based on common standards, and learning is validated by regulated common exams in which learners are required to demonstrate a variety of competences as well as mastery of relevant practical skills (Hippach-Schneider & Huismann, 2016; 2019; Hippach-Schneider, Krause, & Woll, 2007). Successful apprentices are awarded vocational qualifications, which are highly valued by German employers and provide learners with the designation of skilled worker in the labor market (Hippach-Schneider & Huismann, 2016; 2019; Hippach-Schneider, Krause, & Woll, 2007)

In response to COVID-19, Germany has implemented short-time work benefits. Under this system, businesses temporarily reduce working hours, and the state renumerates individuals' lost compensation from the loss of those hours. Prevailing reports indicate that most apprentices have not been put on short-time work because of enterprises' legal obligation to provide training. Instead, apprenticeship providers have been encouraged to adapt their training schedules, transfer apprentices to more COVID-safe departments, or assign tasks to

apprentices that can be performed remotely. Examination requirements have also faced complications. Exams have been able to be scheduled with social distancing protocols in place, but some apprentices have had to negotiate exam extensions in their apprenticeship contracts.

In other cases, apprentice working hours may have been reduced by up to 50% (CEDEFOP COVID-19 Report, 2020).

At the end of May 2020, the German Federal Institute for Vocational Education and Training (BIBB) estimated a reduction of about 25,000 new apprenticeship contracts in 2020 compared to 2019. Some reports indicate that students with higher education entrance qualifications are opting for academic rather than vocational pathways given the challenges with vocational programs caused by the pandemic (CEDEFOP Germany COVID-19 Responses, 2020). In another study from 2020, it was estimated that the pandemic and the resulting lockdown would result in a 6% (or 30,000) reduction in apprenticeship contracts, while the demand for apprentices would be reduced by 9.1% based on employers' business cycle expectations. This study also suggested that even without the effects from the pandemic, many firms would still find it difficult to fill apprenticeship vacancies due to demographic changes and matching problems, that may reduce the number of school leavers (Muehlemann et al., 2020)

2.1.3 Post-Secondary and Tertiary Pathways

Germany is home to a variety of continuing training and career pathways at the post-secondary and tertiary levels. Many of these programs are highly permeable; they can be accessed via onramps from numerous upper secondary VET programs (Hippach-Schneider & Huismann, 2016; 2019; Hippach-Schneider, Krause, & Woll, 2007). Specialized VET programs offered at the postsecondary and tertiary level generally last one to three years and often provide learners with the opportunity to acquire both vocational and general education qualifications, opening up access to higher education. Providers for these programs include specialized upper secondary schools (Fachoberschule), senior vocational schools (Berufsoberschule), full-time vocational schools (Berufsfachschule), and specialized grammar schools (Fachgymnasium) (Hippach-Schneider & Huismann, 2016; 2019; Hippach-Schneider, Krause, & Woll, 2007).

In addition to specialized vocational qualifications, Germany offers advanced vocational qualifications at the short-cycle tertiary, bachelor's, and master's levels that are seen as equivalent to the academic qualifications at these education levels. These qualifications include professional specialist (Geprüfte Berufsspezialist), master craftsperson (Meister), which entitles holders to run their own business, hire and train apprentices, or advance within their current company (Hippach-Schneider & Huismann, 2016; 2019; Hippach-Schneider, Krause, & Woll, 2007). However, the master craftsperson qualification does not require participation in a preparatory course and can be acquired through the passage of exams typically administered by competent bodies, but, students must still have completed a bachelor professional qualification (Hippach-Schneider & Huismann, 2016; 2019 Hippach-Schneider, Krause, & Woll, 2007).

German public and private universities also offer dual study programs that last anywhere between one to four years at the bachelor's or master's level and combine work-based training with academic learning at an education institution. Similar to the dual system, companies bear the cost of the in-company training portion and renumerate the trainee for theoretical training in the academy. The most popular dual study pathway, which requires training at a vocational school in addition to a university, allows learners to acquire both an academic degree and a formal IVET qualification. Other pathways allow students to acquire an academic degree but no VET qualification, or vice versa (Hippach-Schneider & Huismann, 2016; 2019; HippachSchneider, Krause, & Woll, 2007).

Finally, a third institutional pathway through Germany's VET system is a "transition" system (Ubergangssystem) that has recently expanded and received increased attention (HippachSchneider & Huismann, 2016; 2019; Hippach-Schneider, Krause, & Woll, 2007). It is intended for students who are low performing in their VET education and cannot secure a job or an apprenticeship. The system is fairly new, and is considered permanent, as it was created to respond to the high number of people with low qualifications, especially asylum seekers and immigrants (Deissinger, 2019). According to an interview with Deissinger, this transition system is school-based and only loosely connected to the general VET system. It is also more decentralized and gives Federal States significant control over implementation.

2.2 Teaching Requirements & Flexibility

Teachers in VET schools are valued and thus highly qualified (Hippach-Schneider & Huismann, 2016; 2019; Hippach-Schneider, Krause, & Woll, 2007). According to ground-level informants, teachers in school-based settings must hold a master's degree in their field and complete two years of teacher training (though this can vary by state). Most are required to complete an apprenticeship as well. Additional sources indicate similar requirements for practical work instructors in vocational schools; they also need to hold a master's degree in a specific technical field and complete technical training at a company and vocational school. Both categories of teachers also undergo a probationary period of one to two years at their respective vocational institution (Hippach-Schneider & Huismann, 2016; 2019; Hippach-Schneider, Krause, & Woll, 2007).

Medium- and larger-sized companies that offer apprenticeships may have designated trainers and industrial business management assistant clerks whose role is to provide on-the-job training to apprentices (Hippach-Schneider & Huismann, 2016; 2019; Hippach-Schneider, Krause, & Woll, 2007). Trainers may be professionally organized across a large company, and there is a recent trend toward national certificates indicating their training competences. Respondents noted that in smaller companies with apprenticeships, senior workers or managers usually provide the training. In-company trainers need to have a VET qualification at the postsecondary level and sufficient work experience, and they must successfully complete a traineraptitude exam to prove required pedagogical competences (AusbilderEignungsverordnung, AEVO). Additional training is also available to these trainers (Hippach-Schneider & Huismann, 2016; 2019; Hippach-Schneider, Krause, & Woll, 2007).

Upskilling VET teachers in digital competences and updating teaching practices to adapt to technological changes has been a particular point of collaboration between the federal government and the Federal States. Examples include Digital pact for schools and the Quality initiative in teacher education (Hippach-Schneider & Huismann, 2016; 2019; Hippach-Schneider, Krause, & Woll, 2007).

2.3 Student Recruitment and Enrollment

Both employers and their unions are involved in recruiting students into VET and apprenticeships (Hippach-Schneider & Huismann, 2016; 2019; Hippach-Schneider, Krause, & Woll, 2007). More specifically, companies advertise internships to students in primary education around grade 9, which can generate interest in the pursuit of apprenticeships later on in their education. However, because attraction to apprenticeships varies by sector and occupation, recruiting through advertising may be difficult, easy, or wholly unnecessary depending on the employer (Pilz and Fassbender, 2019). Recruitment by firms is also usually localized based on labor market need, and smaller firms tend to be more selective in choosing apprenticeships than larger firms (Dessinger, 2019). Although the dual path is more popular among VET students, and employers generally value apprenticeships despite having to expend resources for training, only about 20 to 25 percent of employers offer apprenticeships. At the end of the apprenticeship, apprentices are eligible to be hired by the same company in which they received their training, but such an arrangement is not guaranteed by either party. According to interviewees, this can create issues when certain companies offer apprenticeships only for others to poach the completers after they finish their training and receive a national qualification. In fact, many employers recruit apprentices with the intention of eventually hiring them as full-time employees, but most estimates show that only about 60 percent of students who successfully complete worked-based VET are hired by the business in which they complete their training.

In addition to direct recruitment conducted by apprenticeship employers, the VET system in Germany also offers students a variety of transition programs before they enter the uppersecondary education level. These VET introductory programs range from 6 to 12 months and can be completed either full-time at a vocational school or in a dual format at a vocational school and training site (Hippach-Schneider & Huismann, 2016; 2019; Hippach-Schneider, Krause, & Woll, 2007). Students in these programs can be credited with a lower secondary school leaving certificate, successful completion of Year 1 of their vocational training in their respective field, or qualification requirements for a subsequent apprenticeship. One of these three transition programs known as introductory training (Einstiegsqualifizierung, or EQ), a 6to12 month dual traineeship in both enterprise and vocational school, has provided a pathway for about 70 percent of German learners to access apprenticeships (Hippach-Schneider & Huismann, 2016; 2019; Hippach-Schneider, Krause, & Woll, 2007).

Guidance also seems to play a central role in the recruitment of VET students. The vocational orientation program analyzes the potential of prospective VET students and allows them to test at least three different occupations through practical placements in companies and intercompany vocational training centers (Hippach-Schneider & Huismann, 2016; 2019; HippachSchneider, Krause, & Woll, 2007). Specific emphasis is given to challenging gender norms and encouraging students to seek careers in which their gender identity has historically been underrepresented. Career start mentors offer individual coaching to at-risk students to support them in completing their lower secondary requirements, setting professional goals, and applying to an apprenticeship (Hippach-Schneider & Huismann, 2016; 2019; HippachSchneider, Krause, & Woll, 2007). These coaches guide students for the duration of the VET program (Hippach-Schneider & Huismann, 2016; 2017, p. 61).

In 2015, German trade unions, employer organizations, Federal States, government representatives, and the Federal Employment Service came together to launch the Alliance for Initial and Further Training (Allianz für Aus- und Weiterbildung), with the goal of expandin access to a VET program to all interested learners (Cedefop 2020 Country Report).

In addition to renumeration from apprenticeship and work-based learning, students in VET programs may also be able to qualify for public subsidies for costs of living, transportation, food, and/or books. Given the growing influx of migrants in the country over the past few decades, particular financial incentives are also targeted toward this population, (Cedefop 2020 Country Report).

In terms of enrollment, the dual system is much more common among students than full-time vocational schooling. For example, in one cohort in 2004, 53 percent of students completed vocational training in the dual system, while only 15 percent completed full-time vocational schooling (Hippach-Schneider & Huismann, 2016; 2019; Hippach-Schneider, Krause, & Woll, 2007). This disparity in the two different kinds of enrollment may be related to employers' large influence over curriculum development and administration in VET.

2.4 Adult Education & Retraining

Unlike Denmark and other EU member states, the adult education system in Germany is considered outside both academic and VET schooling. Despite this more rigid separation, evening schools and some college extension programs do offer adult learners the opportunity to acquire a general leaving certificate as "mature students" (Cedefop, 2020 Country Report). In addition, adult workers who are high school graduates are eligible for apprenticeships within the dual system and can reduce training time to 12 months based on their existing qualifications (Hippach-Schneider & Huismann, 2016; Hippach-Schneider, Krause, & Woll, 2007.) Across most of the adult education ecosystem, the duration of programs is growing shorter, particularly for traditionally long-term programs like Continuing VET (CVET) (Hippach-Schneider & Huismann, 2016; 2019; Hippach-Schneider, Krause, & Woll, 2007).

Over 4 percent of Germany's education budget is dedicated to adult learning; by comparison, 14 percent of UNESCO countries commit between 1 and 0.5 percent of their education budget to adult learning, and fully 20 percent invest only 0.5 percent (UNESCO Global Report on Adult Learning and Education, 2013. It is worth noting, however, that while Germany does invest a higher proportion of its gross education budget into adult education programs, trend studies have shown a general decline in state funding for adult education over the past few years (Nuissl, 2011)

Large employers play a significant role in the provision and financing of adult education. About 25 percent of all employment contracts include education and training regulations in various models and forms. In addition, about two-thirds of in-company continuing education is offered by employers directly or contracted out to other private providers (Cedefop 2020 Country Report). Because many economists are predicting that the country will experience a workforce decline of over 12 percent due to aging within the next few decades, many of these programs have been targeted at older workers (Elliott & Kollewe, 2011).

Examples of employer-supported training schemes include German corporation BASF's "Generations@Work" initiative, which targets adult workers with lifelong training programs as well as other wraparound services like health maintenance and ergonomic support. Similarly, trade unions, particularly those in the chemical industry, have negotiated "demography funds" to catalyze a variety of initiatives in support of older workers, including job training (Blau, 2011).

Beyond funding from employers, regional-level legislation provides most workers with ten working days of paid continuing educational leave over two consecutive calendar years (L&E Global, 2019), provided the training meets certain educational requirements. In addition to this benefit, the Upgrading Training and Assistance Act provides workers with grant funding to upgrade their skills. This grant is part subsidy and part low-interest loan from the state. Every year, approximately 160,000 people receive this grant, making it one of the most significant funding supports for adult learners seeking upskilling. Reforms to Germany's unemployment insurance system in 2016 allow workers with little to no vocational qualifications to receive funding to acquire basic skills that will lead to additional formal education and training. To incentivize workers to remain in their program, these reforms provide workers with a bonus when they successfully complete their interim and final exams (UNESCO, 2012).

Moreover, one of Germany's dual study pathways described above (Berufsintegrierender dualer Studiengang) offers both public and private university-based training with an integrated career component without any higher education entrance requirements (Hippach-Schneider & Huismann, 2016; 2019; Hippach-Schneider, Krause, & Woll, 2007). Designed as continuing professional development programs, these pathways take place alongside a worker's current

occupation. Employers are informed about the worker's studies and can either reduce working time or provide paid leave to the worker. Academic coursework typically takes place during the evening or through distance formats, which likely increased in prominence because of COVID19 (Hippach-Schneider & Huismann, 2016; 2019; Hippach-Schneider, Krause, & Woll, 2007).

In terms of governance over the system, there is little federal-level involvement beyond regulating financing and the general conditions of adult education (European Commission, 2021). Each of the 16 German states set their own priorities and approaches on major aspects such as curriculum, teacher qualifications, and target populations. Therefore, there is less centralization than other EU member states (European Commission, 2021). Content commonly included in adult learning and education are basic competences like literacy, vocational/technical on-the-job training, knowledge generation and innovation, and human rights and civic education (UNESCO, 2012).

The decentralized nature of Germany's adult education system has produced a wide array of providers beyond employment-attached programs. One estimate found that there are over 19,000 adult education institutions in the country (Nuissl, 2011). These include trade unions, institutes of distance education (particularly in rural regions), religious organizations, community-based organizations, and voluntary groups.

The Volkshochschulen (VHS), the largest provider of general adult education in Germany, is a network of 900 adult education centers and 3,000 branch offices that offers around 700,000 events per year (German Adult Education Association, n.d.). Oftentimes, a Volkshochschule serves as the only training provider in many local communities. While these centers are supported by local government, they must earn at least one-third of their revenue from enrollment fees. Recently this requirement has been rising, reflecting the general trend of stagnating public subsidies for adult education. In addition to vocational and work readiness programs, VHS centers generally offer a diverse liberal arts curriculum, including programs in language, health, culture, politics, environment, basic education, and school-leaving qualifications (German Adult Education Association, n.d.).

Germany's public-sector providers are supplemented by various church-based networks of adult education institutions, primarily of Catholic and Protestant denominations. The Catholic Federal Association for Adult Education is the umbrella organization for 600 Catholic adult education providers, making it the largest non-municipal provider of adult education. These institutions typically offer programs on topics ranging from theology, ethics, family life, political education, and personal wellness, as well as vocational and work-related courses (KEB, n.d.).

Recently, the government has begun incentivizing adult learning by providing training vouchers directly to individuals to subsidize adult education, thus experimenting with a demand-side approach rather than a supply-side approach that targets subsidies to employers

(UNESCO, 2012). The 2019 Qualification Opportunities Act has provided the right to workers to access CVET funding if they are affected by structural changes in the labor market or have a desire to seek occupations in need of workers (Cedefop 2020 Country Report).

3. Content

3.1 Curriculum Development & Standardization

In terms of governance over the VET system, the federal government is responsible for designing the dual system training content for the occupations it has recognized (HippachSchneider & Huismann, 2016; 2019; Hippach-Schneider & Huismann, 2019). It implements joint training agreements and provides funding for VET program research, promotion, and evaluation. As stated previously, the Federal States are responsible for schoolbased VET instruction in their jurisdictions and for the professional development of VET teachers. The Federal States also have tripartite vocational training committees that advise them on vocational training issues. Both unions and competent bodies are actively involved in the curriculum development process through these vocational training committees, but employers generally have a stronger voice in the development and maintenance of the VET system (HippachSchneider & Huismann, 2016; 2019; Hippach-Schneider, Krause, & Woll, 2007).

There is comprehensive coordination between the German government and its schools, employers, and their associations, as well as trade unions and their associations. As there is a high level of standardization in apprenticeship programming, VET certificates and qualifications can transfer across companies (Schmidt, 2010, p.7). Here again, employers play a primary role in curriculum development. For example, in the dual system, specific competences must be demonstrated in final exams that are keyed to vocations, occupational processes, and work requirements. Based on additional regulations, there are also individual training plans for each apprentice hosted within a company, which are designed for apprentices to achieve professional competence in their given area (Hippach-Schneider & Huismann, 2016; 2019; Hippach-Schneider & Huismann, 2019). Yet, there is no official rule on how often curriculum are revisited to adapt to the changes in technology and the market. Thus, as one respondent reported, opportunities for redevelopment in curriculum or technology vary across occupations.

Regarding the process for curriculum development, skills anticipation activities conducted primarily by the state regularly produce recommendations based on current labor market conditions. As stated above, VET qualifications can transfer across companies, and apprenticeship training regulations complement competency requirements in vocational schools (Hippach-Schneider & Huismann, 2016; 2019; Hippach-Schneider & Huismann, 2019). Initial efforts to update curriculum are usually catalyzed by trade unions, employer associations, or the state. Once a proposal is submitted, the federal government, in consultation with the Federal States, asks all stakeholders for opinions and recommendations. The updating of training regulations is organized around a four-step, agreed upon process based on a consensus agreement of all stakeholders and takes place annually in order to stay aligned with

current labor market conditions (Hippach-Schneider & Huismann, 2016; 2019; HippachSchneider, Krause, & Woll, 2007).

Training occupations (Ausbildungsberufe) are a key element of the dual VET system in Germany is and form the basis of both school-based and in-company apprenticeship training. These are comprised of standards, occupational characteristics, a two- or three-year training plan, and examination regulations (Hippach-Schneider & Huismann, 2016). As stated above, modularization has not historically been a central imperative of German VET policy development. For at least the past few decades, VET curriculum in Germany is rarely organized around subjects, but rather fields of learning (Lernfelder) "which are geared to the wideranging and problem-based activities that apprentices will encounter as they learn the full range of skills needed to plan, carry out, and monitor tasks" (Pilz & Fürstenau, 2019).

This is not to say that competence-based models are entirely absent from the German system. In fact, each training occupation has a syllabus that outlines goals and content that are competency-oriented and include mastery of actions performed in the everyday activities of the occupation, defined colloquially as vocational action competences (berufliche Handlungskompetenz) (Pilz & Fürstenau, 2019). Importantly, these competences cannot be disarticulated from the standardized VET pathways defined at the national level. However, Germany has established an eight-level national qualifications framework for lifelong learning based on a learningoutcomes approach. These levels are now articulated on VET qualifications certificates and have made the acquisition of competences more transparent (Hippach-Schneider & Huismann, 2016; 2019; Hippach-Schneider, Krause, & Woll, 2007).

3.2 Skills

The "vocational principle" in Germany emphasizes a "holistic competence portfolio that is strictly bound to a uniform pattern of training and regulations that are commonly shared by state, public, and private stakeholders" (Deissinger, 2019). Thus, every student should receive at least some form of uniform education and skill set. In terms of fundamental and employability skills taught across all VET, every vocational action competence is comprised of professional, self, and social competences (Hippach-Schneider & Huismann, 2016; 2019; Hensen & HippachSchneider, 2007).

As a result of Germany's fairly rigid standardization of and holistic approach to VET, teachers do not have much flexibility. Specific sets of standards must be taught in order for students to meet and achieve certain qualifications or complete exams. To better meet local labor market needs, however, local states have begun to exert some influence over curriculum based on suggestions from employers and VET teachers (Hippach-Schneider & Huismann, 2016; 2019; Hippach-Schneider & Huismann, 2019).

To this end, since 2005, the German VET has provided around 250 "additional qualifications" with the goal of enabling learners to rapidly respond to skill needs in the labor market

(Hippach-Schneider & Huismann, 2016; 2019; Hippach-Schneider & Huismann, 2019). These are mostly subject-related specializations that can be acquired in conjunction with standard VET programs and offer an attractive opportunity to upgrade and/or differentiate VET qualifications (Hippach-Schneider & Huismann, 2016; 2019; Hippach-Schneider, Krause, & Woll, 2007).

The lack of soft skills in the labor market have been a growing issue for employers and the German government (Hensen & Hippach-Schneider, 2016). Though a focus on soft skills has not yet been formalized into the VET curriculum, some soft skills are beginning to be taught through problem solving exercises that help develop analytical, interpersonal, communication, and reflection skills (Hensen & Hippach-Schneider, 2016).

4. Other Key Findings

The German VET system is based on a traditional conceptualization of the vocational principle (Berufsprinzip) that is undergirded by a general belief that vocational training has essential economic, social, and individual objectives that help to form a holistic system and should not be divided into separate levels or modules (Hippach-Schneider & Huismann, 2016; 2019; HippachSchneider, Krause, & Woll, 2007). Since the turn of the century, EU integration has placed increasing demands for modularization of VET curriculum from member states. These demands have been met with significant resistance from German trade unions and craft sectors, who see such programs as a kind of existential threat to the holistic approach to VET that has been developed in Germany over centuries. Any efforts to implement modularization programs have typically occurred in a hybrid, rather than radical, fashion. The certification and recognition of modules seems to be an enduring challenge for these efforts. Some experimentation has been occurring with Training Building Blocks (Ausbildungsbausteine) programs, which are based on a training framework that is subdivided into seven or more individually certified, outputoriented, competency-based building blocks (Hippach-Schneider & Huismann, 2016; 2019; Hippach-Schneider, Krause, & Woll, 2007). The objective of these kinds of programs is to prepare young people for employment, but because they exist mostly separate from the traditional dual system, they do not have the same kind of high social standing as a vocational qualification acquired through the dual system (Hippach-Schneider & Huismann, 2016; 2019; Hippach-Schneider, Krause, & Woll, 2007).

While partial completion of VET programs may offer job seekers some reputation enhancement in the labor market, it seems that full completion of VET education is the generally accepted norm as a requirement for employment in skilled occupations in the German system. In general, individuals without formally recognized vocational qualifications seem to experience difficulties in the labor market.

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Appendix B – France Country Brief

James Boyle, Justin Vinton, Heather McKay

1. Introduction

This section will provide an overview of France's Vocational Education and Training (VET) system. Undergoing significant reforms in both practice and governance since the 1980s, the French VET system has become more practice-oriented over the past three decades, while still maintaining its strong school-based, theoretical, and holistic approach directed at different aspects of the whole person (Pigeaud et al., 2019. The state's role has been central throughout the history of the system, and more recent reforms have allowed the state to centralize control over vocational qualifications while still incorporating strong administrative powers for both worker and employer representatives (Pigeaud et al., 2019).

France has had almost 20 years of experience in the validation of informal and non-formal learning, laying a strong foundation for a national qualifications framework that has helped extend the diversity of vocational training activities and providers (Pigeaud et al., 2019). It has also allowed many qualifications delivered outside of the formal VET system to be recognized as valuable. This tracks well with a more diverse market for initial or adult VET (CVET) featuring a wide array of providers and undergirded by strong public supports (Pigeaud et al., 2019).

Today, both the French VET and CVET system are structured by a rights-based notion of vocational training. French law has enshrined the right to a professional qualification, as well continuing professional training and development, for all citizens (Pigeaud et al., 2019). The competence-based system, now a legal requirement for all qualifications catalogued in the national registry, has led to increased variance in the qualifications market and, in turn, to ample off-ramps into direct employment (Pigeaud et al., 2019).

2. Structure

2.1 Education Pathways & Providers

In France, the VET and higher education systems are not as rigidly separated as they are in other EU member nations (Powell et al., 2012). This is in part because the French VET system relies more heavily on school-based instruction than those in countries such as Germany which rely heavily on apprenticeships and work-based learning opportunities. (Brockmann et al., 2008). However, France has a very robust national qualifications system, and all state-developed qualifications can also be acquired via lifelong learning opportunities and the validation of nonformal and informal learning outside of the traditional education system (Pigeaud et al., 2016).

Students generally enter initial vocational education (IVET) at the age of 15 (Pigeaud et al. 2016). Because there are both two- and three-year pathways for IVET, students may be 17 or 18 when they complete their program (Pigeaud et al., 2016).

As a result of COVID-19, regular contact has been maintained in school-based VET formats through real-time remote technologies. Particular attention has been given to disadvantaged students who may not have access to the required technology. Digital workspaces and online platforms have scaled up considerably as a result of social distancing protocols. In in-company settings, learning continuity has sometimes been maintained through digital learning, and free online resources have been made available by the state. The system has allowed apprenticeship contracts to be extended if training is forced to be postponed. France has also activated shortwork time and allowed firms to substitute reduced working hours with paid training for their workers (ReferNet France, 2020).

VET is offered from the upper secondary to the tertiary education level. There are a variety of academic and career milestones available to VET learners, depending on the pathway chosen.

2.1.1 Secondary-level pathways

In France, secondary education is provided in collèges (junior high schools) and lycées (senior high schools) (Pigeaud et al., 2016). In junior high school, vocational courses at the lower secondary level are offered to students ages 11 to 15 that can help them prepare for an apprenticeship. After completing lower secondary schooling at the age of 15, learners may choose from a variety of upper secondary education pathways provided by senior high schools (Pigeaud et al., 2019).

There is a three-year path leading to a general baccalaureate degree (baccalaureat - BAC), which provides access to higher education and tertiary level studies (Pigeaud et al., 2019). There is also a three-year technological path leading to the technological baccalaureate (baccalaureat technique), which opens up the possibility to follow VET studies offered at EQF levels 5 or 6 (Pigeaud et al., 2019). The first year of instruction is very similar in both the technological and general pathways, with the technological pathway becoming more vocationally oriented in the final two years. In addition, at the upper secondary level there is a distinct two-year vocational path that leads to a professional skills certificate at EQF level 3 (CAP) and a three-year path leading to a vocational baccalaureate at EQF level 4 (BAC-pro). Those with a CAP may also continue in a one-year school-based program to receive the applied arts certificate (EQF level 4) (Pigeaud et al., 2019). A CAP qualification allows students to further pursue a vocational baccalaureate, while a vocational baccalaureate allows students to enter tertiary VET. However, both qualifications are designed to lead to employment and are recognized in the labor market (Pigeaud et al., 2019).

The following list goes into more detail on the various VET qualifications that can acquired at the secondary level in France:

- CAP (Certificat d' aptitude professionnelle/professional skills certificate), EQF level 3 demonstrates a first level of qualification as qualified worker or employee in a given employment sector. There are around 200 CAP specialties relevant to the industrial, commercial, and service sectors. CAP provides direct access to employment and/or to upper secondary vocational studies to prepare for a BM (brevet de maitrise/advanced diploma) or a baccalaureate, either at school or through an apprenticeship (Pigeaud et al., 2016).
- Vocational baccalaureate (Baccalauréat professionnelle), EQF level 4 allows successful candidates to enter a profession. Programs last three years (age 15 to 18) and span almost 90 specialties (Pigeaud et al., 2016).
- BMA (Brevet des métiers d'arts/Applied Arts certificate) is a national qualification in a specific skill, which aims to preserve and pass on traditional techniques while promoting innovation. It is available to holders of a CAP in the same professional sector. The program consists of vocational training specific to each BMA specialty, general education, and work placements lasting between 12 and 16 weeks. There are currently 22 BMA specialties (Pigeaud et al., 2016).

As stated above, students can complete IVET qualifications at a vocational lycée (senior high school) or an apprenticeship training center. Vocational senior high schools provide general subject education, theoretical and practical vocational training, and internships at workplaces (Pigeaud et al., 2019). Students can complete their CAP within these institutions over two years, about a quarter of which is spent in an internship. The vocational baccalaureate can also be completed over three years, about 22 weeks of which is spent in an internship (Pigeaud et al., 2019).

Apprenticeship training centers (CFAs) combine work-based and school-based learning, with 60 to 75 percent of the apprentice's time being spent at a company. Students must complete 800 hours of training at the apprenticeship training center for the CAP and around 2,000 hours for the vocational baccalaureate (Pigeaud et al., 2019). These providers can be both public and private institutions (Pigeaud et al., 2019).

Regardless of whether students choose a school-based or apprenticeship route, they will be required to conduct some form of work-based learning. As stated above, apprenticeships are coordinated by apprenticeship training centers, which are now open to integration in all vocational education institutions. All VET qualifications offered in a school-based learning setting can also be acquired in an apprenticeship setting. Skills operators, 11 industry-level collectives that support apprenticeship programs, assist in covering the costs for apprentices and apprenticeship teachers (Pigeaud et al., 2019). Apprentices are typically paid 25 percent of the standard minimum wage, and employers are exempt from paying into social security benefits for apprentices (Pigeaud et al., 2019).

In addition to these secondary pathways, all individuals can acquire professional diplomas (Titre professionnel), which are state certificates designed and awarded by the Ministry of Labor (Pigeaud et al., 2019). These are module-based qualifications with off ramps to employment at multiple points between the upper secondary and bachelor's levels, and they enable individuals to acquire specific skills and competences to support their employability and professional development. They cover all sectors and can be acquired in a traditional school setting, through the validation of informal learning, or in continuing training programs (Pigeaud et al., 2019).

2.1.2 Post-secondary and tertiary pathways

- DUT (Diplôme universitaire technologique/Undergraduate certificate of technology), EQF level 5, is a two-year vocational degree open to people with a baccalaureate or equivalent. It offers training in 24 specialties. Preparation for a DUT is provided by IUTs (university technology institutes) attached to universities. These qualifications prepare people for technical and professional management roles in certain sectors of production, applied research, and the service sector. It is also possible for DUT holders to pursue their education, for example towards a bachelor's degree (Pigeaud et al., 2016).
- BTS (Brevet de technicien supérieur/advanced technician certificate), EQF level 5, provides access to a two-year professional qualification to people with a vocational baccalaureate or equivalent. Specialist education and training takes place in a lycée, and the program includes one or more internships. The central purpose of this certificate is immediate entry into work, but it is also possible to continue studies toward a vocational bachelor's degree (Pigeaud et al., 2019).

2.1.3 Bachelor's and master's pathways

Students who complete vocational qualifications at the upper secondary or tertiary pathways can continue into vocational bachelor's and master's programs. These qualifications can only be awarded by a legally certified EPSCP (établissements publics à caractère scientifique, culturel et professionnel/scientific, cultural, and professional public institution), even if the qualification was awarded via informal learning validation (Pigeaud et al., 2019). Private education institutions can only award bachelor's or master's degrees if they have signed an agreement with an EPSCP (Pigeaud et al., 2019). Students studying at a university can either enter a full-time degree program combined with one or more internships or go into an apprenticeship program, through a "sandwich course" at the university, and combine work-based and schoolbased instruction (Pigeaud et al., 2019). More detail on these pathways, including on-ramps from lower vocational education levels, is provided below.

- Bachelor's degree (Licence), EQF level 6, is a nationally recognized higher education qualification provided at a university. Successful completion of a vocational baccalaureate or the validation of equivalent prior learning is required for entry into this kind of program. Virtually all disciplines and sectors offer this qualification. Both academic and vocational bachelor's degree programs begin with common multidisciplinary core subjects and gradually become more specialized over three years, the typical program length (Pigeaud et al., 2019).
- Vocational bachelor's degree (Licence Professionnelle), EQF level 6, is another national qualification issued by a university but is more fast-tracked than the standard bachelor's degree. These programs last just one year rather than the three-year span of traditional bachelor's programs. Qualification requirements include successful completion of a baccalaureate, BTS, or DUT. Programs are structured in a traditional dual format, combining theoretical and methodological learning with practical learning. Students are also required to complete a 12- to 16-week work placement as well as a supervised work project (Pigeaud et al., 2019).
- Master's degree, EQF level 7, offered by a university, occurs over two years and is available to people with a bachelor's degree or equivalent prior informal learning. Vocational components are included in the course content in addition to theoretical and methodological elements. One or more internships may be required along with the completion of a dissertation or research work. Successful completers can go into more specialized professions that require a master's qualification or continue into a Ph.D. program (Pigeaud et al., 2019).

Sectoral Qualifications

In France, the training market is free. In other words, training providers outside of the state do not have to consult the government about the way they organize their courses or qualifications. This legal basis has provided the foundation for a variety of sectoral qualifications that are typically designed and awarded by industry players to meet sectoral labor market skill needs (Pigeaud et al., 2019).

Certificates of professional qualifications (CQP) are created, issued, and delivered by joint industry bodies, usually the National Joint Employment Committee. These are not classified by specific level of qualifications but instead are catalogued in the National Register of Qualifications (RNCP) by sector of activity (Pigeaud et al., 2019). Although CQPs cannot be accessed in traditional schools, the state has begun to take management responsibility over these certificates due to recent reforms in VET governance over the past three years (described more below) (Pigeaud et al., 2019).

A qualified engineer degree (titre d'ingénieur diplômé), offered at the master's level, is awarded after a 5-year program at a public or private engineering school that has been accredited by the engineering qualification committee (commission des titres d'ingénieur) (Pigeaud et al., 2019). This title of qualified engineer holds both an academic and professional value and allows a recipient to begin working as an engineer.

There are over 60 'state-approved' business and management schools that provide qualifications at the bachelor's or master's level through three- to five-year training programs. The state-approved designation gives these diplomas value as national qualifications and provides holders with access to the traditional academic degree pathway (Pigeaud et al., 2019,).

VET training providers can offer their own qualifications that may simply be recognized and validated by a professional community or go through a process of recognition conducted by the National Committee on Vocational Qualifications (CNCP) for cataloguing in the RNCP. Inclusion in the RNCP indicates that the state and social partners (both employer and employee associations) recognize the value of the qualification (Pigeaud et al., 2019).

2.2 Teaching Requirements for VET

Vocational teachers in a school-based program must complete a national entrance examination. To qualify for this exam, prospective teachers must demonstrate either a qualification in the subject they will teach or a number or years of work experience in the relevant profession (Pigeaud et al., 2019). Vocational teachers are also included in national training plans and can access continuing training programs targeted to vocational educators.

There is no national exam for teachers/trainers in apprenticeship programs; training centers in this context conduct their own recruitment. Applicants for general teaching roles within the apprenticeship system generally need to demonstrate a qualification that is equivalent to a similar position at a public institution. For technical, theoretical, and practical teaching/training roles, applicants usually need to demonstrate that they hold a qualification that is at least equivalent to the qualification their apprentices will be working toward as well as work experience in the relevant profession (Pigeaud et al., 2019).

Strengthening the use of digital technologies in VET programs has been a major item on the policy agenda since 2015. The system has been piloting new pedagogical formats as well as providing technical resources, teacher training, and funding (Pigeaud, et al., 2019).

2.3 Student Recruitment and Enrollment

Much of the incentivization of new recruitment for VET students comes through public subsidies that reward employers for engaging in apprenticeship and work-based learning opportunities (Pigeaud et al., 2019). As stated above, the costs of training apprenticeship supervisors are covered by the skills operators, and companies can receive subsidies if they recruit apprentices with disabilities. Specific public incentives are also targeted to small- and

medium-sized businesses, and there is public support for incentives to support individual learners' access to CVET programs (Pigeaud et al., 2019).

Moreover, since 2009, all French citizens have had the right to lifelong career guidance, which can be accessed in a variety of formats (Pigeaud et al., 2019). This includes online guidance for all system and regional career information and advice services. In grade 9, French students in lower secondary programs are offered a preparatory vocational guidance subject to raise awareness about upper secondary vocational schooling and apprenticeship opportunities (Pigeaud et al., 2019). Le parcours aveni is a support program available to young people and their families to provide information and guidance on education pathways and to assist in the transition to vocational school (Pigeaud et al., 2019).

2.4 Adult Education & Retraining

Adult and Continuing vocational education (CVET) is defined as a national obligation, and workers seeking reskilling/upskilling have a wide array of supports available. Adults in France have access to all qualifications available to traditional learners through adult learning and CVET institutions, often in a shorter time frame (Euroguidance, 2014). Moreover, all French citizens have the right to a skills assessment that allows workers to take stock of their skills, aptitudes, and motivations as well as to define a professional training plan based on their results (Pigeaud et al., 2019). This is conducted by an outside intervener and may be initiated by an employer or by the worker themselves.

Moreover, all workers with at least a year of service to a company have the right to 20 hours of personal training per year, which may accumulate to up to 150 hours over 9 years within a personal training account (Pigeaud et al., 2019). In addition, private-sector workers are eligible for an individual training leave of up to one year or 1,200 hours part-time for programs that are outside their employer's official training plan. Subsidized by an equal fund system from an education tax on employers, workers are typically funded between 80 and 100 percent of their previous gross annual salary for the duration of their leave (Schreiber-Barsch, 2015: German Institute for Adult Education). Private-sector employees also can be assigned company-based competence plans in which their employer directly provides and finances reskilling/upskilling (Sgarzi, 2019).

Since 2019 French citizens, both part-time and full-time employees, were entitled to personal training support in the form of 500 euros per year over the course of 10 years (5000 euros maximum, and even more for employees with low qualifications) to enroll in career transition training at various training organizations. This financial assistance targeted industry sectors that had insufficient demand for employment (Pigeaud et al., 2019). The entitlement is increased for people with low qualifications. The reforms established similar personal training accounts for workers seeking career transition, which are funded by the worker's employer who is then reimbursed by the state (Pigeaud et al., 2019).

One of the most significant mechanisms for reskilling in France is its collection of GRETA networks—public educational establishments (schools and general, vocational, and technical colleges) that are grouped together depending on their geographical proximity that pool their skills to provide ongoing training for adults. Coordinated by the Ministry of Education, they offer comprehensive training across France's 22 regions. There are over 250 GRETA networks in the country, offering over 6,000 training sites. These networks provide adult and continuing education based on local training demands from both the general population as well as institutions in the community such as private companies and prisons. GRETA networks training typically takes place on the campuses of the institutions in each group, but networks are increasingly offering training online (Schreiber-Barsch, 2015),).

According to French law, employers must offer training plans for workers as described above. Mandatory training initiatives are typically part of collective agreements that are directly linked to activities at the workplace or a planned change in the worker(s)'s responsibilities. Employees are compensated their normal pay for time spent in this training, which usually takes place during working hours. Non-compulsory training opportunities typically include training that is applicable to professional and vocational education unrelated to a workers' current occupation. If initiated by an employer, the company must receive written consent from the worker, who cannot be dismissed for refusal to take part in these forms of training. These can take place during or outside of working hours (European Monitoring Centre on Change, 2019)

3. Content

3.1 Curriculum Development/Labor Market Alignment

Governance of the VET system is the responsibility of the national state, regional governments, trade unions, and business representatives (Pigeaud et al., 2019). The VET system reforms of 2018 created a new agency, France Compétences, which brings together the state, regions, and social partners under a single umbrella and enhances the power and authority of the state within the system (Pigeaud et al., 2019). At the national level, the Ministry of Education, in consultation with business partners, develops and defines standards and examinations for VET qualifications, provides quality assurance, and assists with the recruitment of instructors. Regional governments plan and define policies based on their local priorities in collaboration with social partners (Pigeaud et al., 2019)

Social partners participate in organizations such as the National Committee on Collective Bargaining to issue opinions on draft legislation around VET policy (Pigeaud et al., 2019). More centrally, the 2018 reforms established 11 skills operators based on industries (Pigeaud et al., 2019). These are collective bodies that help ensure the financing of apprenticeship and professionalization contracts, anticipate training needs in industries, and implement transition projects through the use of personal training accounts and other funding schemes. These bodies also provide targeted assistance to small- and medium-sized businesses in defining and implementing training plans (Pigeaud et al., 2019).

3.2 Skills

France has a national register for vocational qualifications awarded by public and private institutions and professional organizations. France Compétences oversees the certification processes for qualifications in this registry (Pigeaud et al., 2019). These qualifications are nationally recognized and are classified by the field of activity and the level of qualification. Since 2019, it has been mandatory that all qualifications in the national registry are structured in a modular, skill-based framework. These changes have allowed more equivalences and bridges between qualifications as well as greater integration of the validation of prior learning (Pigeaud et al., 2019, p. 38). To receive certification from France Compétences, training organizations must demonstrate that their curriculum is structured in competence blocks that are publicly available (Pigeaud et al., 2019).

Recent reforms to the VET system have expanded the definition of training activity to include position tests, distance learning, and on-the-job training (Pigeaud et al., 2019). This has allowed training organizations to increase variety in their course offerings and instructional designs. Moreover, these reforms have allowed any training organization to also establish an apprenticeship training center, allowing these institutions to offer both types of pathways to their students (Pigeaud et al., 2019).

Vocational advisory committees (CPCs) are integral to the development of VET qualifications and are comprised of employers, trade unions, trainers, and state representatives. They are divided at the sectoral level and help to define VET qualifications based on the training needs in their respective labor markets (Pigeaud et al., 2019). There are also joint employment and vocational training committees in each industry made up of employer and trade union representatives that conduct research to identify training priorities and make requests for new qualifications to be added to the National Qualifications Registry. These activities are informed by research and analysis performed by observatories of trades and qualifications, one of which is required to be present in each major industry (Pigeaud et al., 2019).

Since 2017, France has defined six key competences to be addressed in both compulsory education and vocational education programs:

- Languages for thinking and communicating.
- Methods and tools for learning.
- Education for the individual and the citizen.
- Natural systems and technical systems.
- Representations of the world and human activity.

In addition, the following key competences related to employability or "soft" skills are promoted in upper secondary VET programs across France: 1) interpersonal, intercultural, and social competences, 2) civic competence, 3) entrepreneurship (Pigeaud et al., 2019). Since 2019, the National qualifications framework has structured individual qualifications in an eight-level framework (Pigeaud et al., 2019)..

4. Other Key Findings

As described above, within the VET system, a variety of mechanisms exist for partial completion or off-ramps that can lead directly into employment (Pigeaud et al., 2019). Professional diplomas are a good example of this, as these lead to the acquisition of specific skills and are module-based, allowing students to acquire employment-ready competences that are seen as valuable qualifications across the country. Beyond professional diplomas, for the past decade, France has promoted training schemes that provide key competences and career management skills but do not lead to full qualifications (Pigeaud et al., 2019). In addition, all upper secondary VET programs can offer completers either direct access to employment or further training at the post-secondary and tertiary levels. Moreover, the robust system of validation of prior learning offers the opportunity for learners to be awarded partial or even full qualifications without having to attend additional training.

Whether partial qualifications are socially accepted deserves further research and analysis. For example, while a country like Germany has started to offer more module-based VET opportunities (albeit in highly limited formats), partial qualifications are not significantly beneficial on the labor market there given the stature that a complete qualification from the VET system holds in German society. France seems to have a deeper history and more national-level acceptance of the validation of prior learning, so workers with partial qualifications may have better career prospects (Pigeaud et al., 2019). More empirical evidence is needed to explore this concept further.

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Appendix C – Austria Country Brief

James Boyle, Heather McKay, Justin Vinton

1. Introduction

This section will provide an overview of Austria's Vocational Education and Training (VET) system. In Austria, the Federal Ministry of Education (*Bundesministerium für Bildung*) has overall legislative and implementation responsibility for primary and secondary education and schoolbased VET. However, decision-making is shared across central government, the provinces, municipalities, schools, and social partners. VET teachers and providers also have a high degree of influence and freedom in terms of delivery and agenda setting (Tritscher-Archan, 2016).

The Austrian system is defined by a two-pillar system of school-based and "dual" VET models that combine theoretical and practical on-the-job instruction. Within these major divisions, there is a great deal of variation. Notably, many variants on the traditional VET pathway have produced deep linkages between the academic and vocational education systems that allow students to crossover between the two, in both directions (Hoeckel, 2010).

There are robust public funding supports for both learners as well as companies, pre-vocational programs, and early-start career guidance. These supports have the potential to continue throughout an individual's lifespan, contributing to a strong recruitment system for VET students. CVET (VET programming for adults), although widely available, is generally less regulated than the main VET system, and the less dense legal constraints seem to allow these programs to respond to labor market changes more adeptly (Tritscher-Archan, 2016).

2. Structure

2.1 Education Pathways & Providers

Austria has a two-pillar system of education similar to that of Germany. It consists of full-time school-based VET and an apprenticeship system, usually provided in partnership between private and public sector entities. Within this dual structure, there are diverse pathways, reflecting the importance the system holds within Austrian society. The Austrian system differs from that of Germany, however, in that it more focused on school-based VET than apprenticeships. Students in Austria can start VET as early as age 14 and can finish their technical education at around age 18 or 19. More specialized training at the post-secondary level may continue beyond that age (Tritscher-Archan, 2016). Students approaching their upper secondary level can choose to attend general secondary school, VET programs, or prevocational programs that lead to an apprenticeship. As the school-based VET is more prevalent, after grade 8 students can choose to enter a VET program, including three- or four-year VET offered by

intermediate vocational schools or five-year VET offered by colleges. Pre-requisites may be required to enter these programs, especially if there is high demand for that program. From these VET programs, there are pathways to further education including higher education or professional qualifications to enter senior-level occupations and regulated professions.

VET providers include Austrian government-funded schools, employers, and unions. Unions have pushed for non-firm-based training as an alternative, not a rival, to firm-based training like apprenticeships. Supra-companies, which operate and offer training workshops outside of traditional companies themselves, are becoming a popular vocational training option and can lead to company placements and apprenticeship certificates (Schlögl, et al., 2020).

The following subsections describe the various pathways available to vocational students.

School-based VET

School-based VET programs provide both general and vocational education, opening up doors to continuing and higher-level vocational programs as well as direct entry into the labor market. These programs are publicly funded, and attendance is free. In general, there are two major programmatic divisions: three- to four-year intermediate VET programs offered at the upper secondary level at vocational schools (BMS) and five-year higher VET offered at both the upper secondary and short-cycle tertiary levels at colleges (BHS). An alternative BHS pathway is offered to currently employed learners; the curriculum is designed to be completed through evening classes and distance learning formats over a three- or four-year timeframe, depending on the learner's previous qualifications. Both BHS pathways are assessed with a final examination (Tritscher-Archan, 2016).

Successful completion of BMS programs can immediately provide graduates with qualifications for intermediate occupation levels as well as continuing and tertiary VET programs. Graduates of BHS programs can gain general access to higher education programs, senior-level occupations, and some forms of self-employment (Tritscher-Archan, 2016).

Under current COVID-19 restrictions, VET schools cannot accommodate all students due to limited class sizes, and it is increasingly difficult for students to get hands-on experience due to work settings being closed or open with only limited staff. However, some creative ways to offer training have been pursued, such as developing a specific training program outside of the company setting for students in their first few years if they are unable to find an apprenticeship or work at a firm. According to a ground-level informant, there is also a regional aspect to securing training opportunities during the pandemic in that it has been easier to offer students flexible options in cities than in more rural areas.

Dual VET (Apprenticeship)

Austria is home to over 200 legally recognized apprenticeship programs in which students take classes at a part-time vocational school and also work onsite at a hosting company. Nine years
of compulsory education is required to enter this program, and about one-third of all apprentices have also attended pre-vocational programs.. Apprenticeships are typically found by the learners, although various public employment and education services provide support for matching learners with apprenticeships sites. Once a learner has found a training company, they sign an apprenticeship agreement with an authorized apprenticeship trainer. Apprenticeship offices (*Lehrlingsstellen*), located in the Economic Chambers in the federal provinces, keep records of apprenticeship agreements, advise apprentices and training companies, and organize apprenticeship-leave examinations (Tritscher-Archan, 2016).

A national training regulation (*Ausbildungsordnung*) exists for all apprenticeships, including a job profile (*Berufsbild*), or a company-based curriculum that articulates the minimum skills and knowledge that learners will receive from their training company, and a competence profile (*Berufsprofil*), which describes the outcome-oriented competences that apprentices must master by the end of their program. Social partners have a very high degree of influence over apprenticeship curricula, competence profiles, structures, and content given their roles on various advisory councils (Tritscher-Archan, 2016). One respondent stated that unions play a hands-on role. Although apprentices are not official union members while they are trained at a company, a union steward often acts as a special counselor who looks after students' working conditions.

Following program completion, apprentices can take the leave exam to determine whether appropriate skills were gained to perform necessary activities connected to the occupation. There are also post-apprenticeship education options, including continuing VET for a skilled craft or entry into higher education (Dessinger, 2012; Tritscher-Archan, 2016).

Apprenticeships are typically offered by small and mid-size companies. Interview data provide insight into the reasons for hosting apprenticeships. Some employers do so because they hope to find students they will hire permanently in the future. Conversely, some employers take on students as apprentices because of tradition and the culture of their role in training youth in Austria.

In recent years, however, the willingness and ability of firms to offer apprenticeships as well as the demand for skilled workers have decreased. This has led to the growth of supra-company training (*ÜBA*, *Überbetriebliche Berufsausbildung*), which is viewed as equivalent to the standard dual VET pathway. In this pathway, school-based instruction is still provided by a part-time vocational school, but practical training is conducted in publicly funded supra-company workshops (comparable to workshops in vocational schools) rather than at operational realworld companies. Students in supra-company training may interface with companies through in-company placements, but workshops remain the primary site of practical training. As in traditional apprenticeships, students in these programs take an apprenticeship leave exam and are awarded an apprenticeship certificate (Schlögl, et al., 2020)

Alternative pathways through the dual VET system present inclusive options that allow learners to extend their training period if they need more time to master skills or to acquire partial qualifications. Students in these programs are advised by the Vocational Training Assistance Service (*Berufsausbildungsassistenz*) before and during their training. These pathways require successful completion of an apprenticeship leave exam as well as attendance at parttime vocational school, although the amount of time spent there is based on the individual situation of each learner. For students looking to acquire partial qualifications, the leave exam is only based on the competences specified beforehand by the learner. The level of qualification attained in this situation is determined by professional experts and the Vocational Training Assistance Service (Tritscher-Archan, 2016).

A final variation on the dual system is a pathway that provides apprentices with direct access to higher education while they complete their apprenticeship. Apprentices on this pathway take preparatory courses and complete partial exams for the *Berufsreifeprüfung* (BRP) examination (see Section 2.1.3) free of charge alongside their apprenticeship training. Alternatively, apprentices may choose to complete their BRP examination for free after completing their vocational certificate instead of in combination (Tritscher-Archan, 2016).

The impacts of COVID-19 on the dual system have varied based on the industry in which incompany training is taking place. In industries such as tourism and non-essential services, many apprentices spent weeks at home and were only able to delve into theoretical material via distance learning. Some companies have attempted to maintain their training services through workshops or remote options. Conversely, many apprentices in essential services and critical infrastructure received exemptions from schooling to allow them to assist in rapid production increases in these industries. Unlike their counterparts in Germany, apprentices in Austria have been included in the activation of short-time work, with the government allowing training hours to be reduced to zero for a maximum of three months through the end of August 2020. Distance learning infrastructure has also seen a noticeable boost as a result of the pandemic (ReferNet Austria, 2020).

Post-secondary, higher level, and tertiary VET

As stated above, more specialized VET programs are offered beyond the upper secondary level and allow for a high degree for cross-permeability with academic higher education programs.

Graduates of school-based BMS programs are able to take add-on courses (*Aufbaulehrgänge*) at the short-cycle tertiary level, which allow students to acquire the qualifications of BHS programs. Apprenticeship graduates can also take add-on courses, but typically need to take one or two semesters of preparatory courses beforehand. These courses are based on general education and in-depth modules, and are often offered in combination with other postsecondary VET courses. Students who successfully complete these courses can usually access employment in specialist areas or academic programs in higher education institutions (Tritscher-Archan, 2016). Besides add-on courses, specific post-secondary VET programs are also targeted to learners who have graduated general secondary programs but do not have any vocational qualifications.

Pre-requisites for these programs are only based on higher education entrance examinations and do not require any vocational experience. In this way, these post-secondary VET opportunities are examples of on-ramps between the academic and vocational sides of the education system that are specially designed for learners who may want to start vocational training later in their learning careers (Tritscher-Archan, 2016).

Higher level VET programs at the short-cycle tertiary level are also offered at continuing vocational education and training (CVET) institutions (*Meisterschule, Werkmeisterschule, Bauhandwerkerschule*) as well as social partner institutions that provide subject-specific VET. These programs include master craftsperson, industrial master, and building craftsperson qualifications, which are awarded based on a five-module exam overseen by an exam committee. Successful graduates of these programs have the ability to train apprentices themselves as well as gain entrance into bachelor's programs at universities of applied sciences (*Fachhochschule*) under certain conditions (Tritscher-Archan, 2016).

Higher education institutions, universities of applied sciences, and CVET centers also offer VET programs at the tertiary level through vocational bachelor's and master's programs. Admission typically requires a higher education entrance qualification which can be acquired through an academic secondary program or one of the higher vocational programs described above. Moreover, graduates of school-based and dual system programs at the secondary level can also gain access to academic higher education through successful completion of the *Berufsreifeprüfung* (BRP) examination, which consists four partial exams: German, mathematics, one modern language, and a vocational specialization. Preparatory courses are offered at CVET institutions, and students can apply for grant funding for these courses as needed. As described above, apprentices can have their costs fully covered. Certain vocational qualifications can also open up access to higher education without the holder having to take a matriculation exam, although other assessments may be required and only a partial range of higher education programs are typically available to individuals with these qualifications (Tritscher-Archan, 2016).

2.2 Teaching Requirements and Flexibility

In Austria, there are three types of VET instructional professionals: 1) practical trainers for incompany training or workshops in schools; 2) teachers in vocational schools who teach theoretical aspects of vocational disciplines; and 3) general education teachers in vocational schools. While qualifications vary based on the type of instructor, most VET teachers need to hold a bachelor's degree, master's degree, or the title of Master Craftsman. In addition, vocational teachers usually need two to three years of work experience in the relevant occupational practice, while in-company trainers need at least six years of work experience

(Hoeckel, 2010). Teachers in BMS or BHS programs must have pedagogical training from a higher education institution.

VET teachers are, in principle, obliged to attend continuing education and training programs, although there are no legal requirements on the duration or frequency of such training. Nationwide continuing education programs are planned and announced by federal ministries and take place at the nine university colleges of teacher education in Austria. Subjects of training include academic theory, didactics, pedagogy, and professional development and include topics like e-learning. In-service programs are also offered by companies so VET teachers can stay up to date on developments in their respective fields (Wagner, 2016).

The Austrian VET system offers a high degree of flexibility at the school level when it comes to course rollout. Vocational schools can change the number of hours of instruction they will dedicate to individual subjects within a certain range, offer new subjects, or specify training focuses and specializations to respond to regional labor market conditions. In addition, while curriculum frameworks are developed primarily at the national level, vocational schools can modify curriculum to a certain extent when it is implemented at their respective institutions (Tritscher-Archan, 2016). Teachers are also active stakeholders in the curriculum development process. They sit on curriculum committees with state experts and representatives of the economy to develop draft curricula for the subjects the teach (Tritscher-Archan, 2016).

In terms of state control over teaching, Austria has used the VET Quality Initiative (QIBB) for quality assurance of the VET system since 2006. The QIBB leverages quality management instruments at all levels of the VET system, including national evaluations individual feedback, peer review, reporting, and professional development of VET teachers (Hauz, 2020).

2.3 Student Recruitment and Enrollment

Austrian employers and VET schools coordinate with public employment services to lead students towards appropriate VET programs, including apprenticeships. Further, companies visit VET as well as secondary schools to share the job profiles they are seeking. A respondent stated that this recruitment process may begin earlier in Austria than in other European countries, as the school-to-company training transition can occur at around 15 or 16 years old. This reflects the culture of duty to educate among the country's employers.

Pre-vocational programs are also widely available at the upper secondary level for students between the ages of 14 and 15. These programs are typically one to two years in length and often take place at an intermediate vocational school and serve as an introduction to VET. Program activities combine theoretical information with practical experiences such as company tours, training workshops, and job shadowing. Tailored career guidance, counseling, and preparation are other components common to all programs. Students typically select specializations from a predetermined set, although local training providers can expand options based on regional needs. In some programs, students can acquire individual vocational competences, while in others, students can gain transfer qualifications for apprenticeships and upper secondary VET schools (Tritscher-Archan, 2016).

Guidance services play a central role in the recruitment of VET students and the general promotion of VET programs in Austria. Career guidance begins in fifth grade at the lower secondary level and becomes a compulsory subject in seventh and eighth grades for 32 hours per year. Career guidance courses are designed to improve employability and professional skills as well as to help learners examine their career options through work placements and personal contacts with professionals from different industries. In addition to the assistance offered in the school system, the public employment service in Austria coordinates over 60 career guidance centers throughout the country that anyone can access free of charge. As stated above, the public employment service helps prospective apprentices find training sites, but these centers also provide information on job opportunities and career counseling, as well as initial education and training (Tritscher-Archan, 2016).

A variety of funding incentives exist to encourage Austrians to engage with the VET system. In this regard, it is important to consider the funding supports that the Austrian state provides regardless of the type of education program a student is enrolled in. All students who are in upper secondary school or higher education institutions receive (mostly) free public transportation to their school and/or training site, free required textbooks, and have the right to have their family allowance prolonged until age 24. Additionally, for VET students, apprentices can have the costs of preparatory courses for apprenticeship leave examinations covered by the state. Women can receive additional subsidies if they enter apprenticeships with low concentrations of women workers (Tritscher-Archan, 2016). An educational leave program in the form of grants and tax relief is also available to Austrian adults (Eurydice Network., n.d.).

Additional financial incentives are targeted at company and practical training providers involved in the VET system. Every company that trains an apprentice is entitled to 'basic support' that can be acquired at the end of each apprenticeship year. Companies can also receive specific incentives (i.e., more than the basic support compensation) for training adults age 18 and over as apprentices if they are considered unskilled workers (Tritscher-Archan, 2016). Groups of small to medium-sized enterprises (SMEs) can apply for funding through the Impulse Qualification Network to help identify skill needs in their workforce and design coordinated training plans (Chopra-McGowan & Reddy, 2020)

2.4 Adult Education & Retraining

There are two core types of adult learning and education in Austria. One path, VET, leads to a qualification and certificate that corresponds to a university, and the other path, CVET, does not. Although there are attempts to modularize programs and to recognize knowledge and skills previously acquired, there is a cautious strategy toward integrating new forms of informal training into existing formal crediting systems. Thus, CVET training, though outside that formal

system, is designed to be identical to that of initial education while also being accessible for people with jobs and unemployed students. Providers of these types of adult education include universities, non-profit organizations, employers, and unions—the same stakeholders involved in VET delivery. However, most CVET courses and qualifications are non-certified (Schlögl & Schneeberger, 2003).

In general, less rigid legal basis for the system as well as the wide proliferation of non-certified programming allows the CVET sector to more rapidly respond to changes in the labor market compared to the traditional VET, which is subject to more complicated regulation and more rigid legal oversight (Tritscher-Archan, 2016).

Evening schools, also called second chance education in Austria, enable adults to acquire previously missed formal qualifications free of charge. These are organized in a modular system and correspond directly to the "day" version of the course. Programs typically last from two to four years (Austrian Federal Ministry of Education, Science and Research, n.d).

Adults without a school-leaving certificate are eligible to take university entrance exams. Nonformal training providers as well as *Volkshochschulen* provide preparatory courses for adults interested in entering post-secondary education. These courses are not free, although many provinces offer scholarships and subsidies to interested learners (Eurydice Network. n.d).

While there is no national system for recognizing prior learning, nearly all qualifications (except university degrees) can be acquired through external examinations without having to participate in the respective education/training program. The adult education system in Austria is structured by Ö-Cert, a national-level quality assurance framework for training providers. This framework defines basic requirements and quality standards that adult education institutions must meet in order to qualify for public subsidies and grants. The introduction of the framework triggered a shift toward more professionalization within the adult education industry. Accreditation through Ö-Cert has limited timeframe and must be prolonged using the same requirements as the initial application (Ö-CERT Agency, n.d.).

In Austria, the political, social, and governmental responsibility for the training of youth is clear. Regarding adult training, however, responsibility for provision is more ambiguous; at present, companies largely take on this role. For example, in recent years large companies are providing more retraining internally through specially designed courses, not through actual VET schools. An interviewee noted that smaller companies are less likely to offer this form of retraining, leaving continuing education decisions in the hands of local company leaders and management. While not explicitly mandated, nearly 90 percent of Austrian companies provide some sort of continuing vocational education for their employees, with about one-third of the entire workforce attending courses each year. Workers spend an average of about 30 hours of paid work time participating in continuing vocational education programs each year (TritscherArchan, 2016).

Tax incentives play a major role in supporting company-based CVET in Austria. Companies can claim a tax-free training allowance amounting to 20 percent of the cost of external and in-house CVET programs. They can also opt for an education bonus amounting to 6 percent of expenses. Both employees and employers also have a number of ways to claim CVET expenses as tax exempt (Tritscher-Archan, 2016).

In addition to in-company training, Chambers of Labor and the Austrian Trade Union Federation coordinate their own Vocational Training Institute, which is the largest education institution for workers in the country. This institute regularly conducts over 15,000 courses per year at around 150 training locations, utilizing both in-person and distance formats. Most course offerings are based on modular structures, and providers are registered within the ÖCert framework (Berufsförderungsinstitut Österreich, n.d.). This institute also provides educational counseling and career guidance for workers (Tritscher-Archan, 2016).

3. Content

3.1 Curriculum Development and Standardization

Austria has a nationalized system of standardization for both school-based VET and apprenticeship programs. All three social actors—government, employers, and trade unions—influence the design of the country's technical training programs. An interviewee noted that unions are heavily involved in employer training through apprenticeships, while at the federal and regional levels, firms and employers are mandatory members of chambers of government, which exert their voice on laws that impact curriculum, employees, and labor market policy.

3.2 Skills

The most common type of area specializations for school-based VET are engineering, business administration, agriculture and forestry, tourism, art and design, fashion design, and social professions. The most common types of apprenticeship sectors are crafts/trades, commerce, industry, tourism, transportation, information/consulting, and banking and insurance (Tritscher-Archan, 2016). One respondent noted that vocational schools in recent years have made efforts to incorporate "soft" and "transversal" skills into their curriculum, however at this point they are generally geared toward the service sector.

Competence models vary depending on the particular program within school-based VET as well as apprenticeships. In recent years, VET teachers and schools have gained the ability to adjust curriculum to meet their local needs. A respondent said that despite this, curriculum is still primarily developed by the government and its social partners, which is partially based on local skill demands and the availability of resources like training equipment. Employers play an active role in curriculum development, especially that of apprenticeships. There are also advisory councils in which both members of schools and industry help determine standardized curriculums and competence profiles. Unions are also strongly involved in curriculum development and company training.

An entrepreneurial competence is included in all competence models and serves both as an interdisciplinary principle in all program types as well as a required subject in many specialization areas. Other key competences include digital competences as well as the mastery of at least one foreign language. Depending in the specialization, students may be required to learn up to three foreign languages (Tritscher-Archan, 2016). In this way, employability and soft skills remain foundational to the competence-based system in Austrian VET.

4. Other Key Findings

As stated above, the dual system offers the opportunity for learners to acquire partial qualifications based on the attainment of specific competences. This provides a type of off-ramp for learners to go directly into employment, although this type of opportunity is typically targeted to learners with special needs. Recent statistics suggest that about 40 percent of Austrian apprentices remain employed at their training company two years after they have completed their apprenticeship. This proportion is higher in certain industries such as financial services and manufacturing. However, perhaps more tellingly, another 40 percent of former apprentices completely exited the sector they were trained in two years after graduation (Nagl, et al., 2014)

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Appendix D – Finland Country Brief

Heather McKay, James Boyle, Justin Vinton

1. Introduction

Equity and lifelong learning are at the core of the Finnish Vocational Education and Training system. The Constitution of Finland states that all citizens have a right to education (CEDEFOP, 2019b, Tapani & Salonen, 2017; Constitution of Finland, 1999). VET is designed to be accessible to students and workers throughout their life course. The system is free, flexible, and provides pathways into higher education and employment.

Implementation of VET in Finland has changed over time. The most recent policy reform was the Vocational Education and Training Act of 2018 (CEDEFOP, 2019b; Finnish National Agency for Education, 2019). This policy involved a reorganization which placed initial (youth) and continuing (adult) VET under the same legislation. As a result, one policy now serves people throughout the lifecycle including youth, adults, incumbent workers and the unemployed. By focusing on competences, the 2018 reform is more efficient for students, workers, and the labor market, thus making the VET a customer-centric, flexible system that aligns with labor market needs (CEDEFOP, 2019). The reforms included in the legislation were designed with an eye to the realities of the future of work and the need for workers to have accessible opportunities to develop and learn throughout their working lives (CEDEFOP, 2019b).

VET is both common and popular in Finland (CEDEFOP, 2019a). This is demonstrated by the fact that at age 16, about half of all Finnish students choose vocational education as their secondary education curriculum. This high level of participation in secondary vocational education is unique in both Europe and the world (Finnish National Agency for Education, 2019; Virolainen & Stenström, 2014). Notably vocational education is also popular with non-traditional learners, many older students are immigrants to Finland (Finnish National Agency for Education, 2019).

2. Structure

The educational system in Finland is structured to foster lifelong learning and is based on the principle that all people must have equal access to education and training (Haltia, 2021). Finland strives to create an equitable playing field for all children to succeed—in education and every facet of life—providing every child with a box filled with supplies at birth (Fadely, 2020; Cedofep, 2019b; Finnish National Agency for Education, 2019). The Finnish vocational system also has pathways into higher education and flexible options for skilling and reskilling.

2.1 Education Pathways & Providers

There are three main qualification structures in Finnish VET: vocational upper secondary qualification, further vocational qualification, and specialist vocational qualification. Together,

these programs offer nearly 160 VET qualifications. The vocational upper secondary qualification offers both broad vocational skills as well as specific training, while the further vocational qualifications are specialized and advanced. The specialist vocational qualification offers highly advanced or multidisciplinary training and meets the skill needs for employment and work life.

Finland does not dictate how vocational skills must be acquired; they can be achieved through different experiences, training, or can be from prior learning. Qualifications are awarded as long as students meet national qualification standards by demonstrating their competency. As such, VET curriculum is personalized to students in a personal competence development plan. This plan is developed collaboratively by the student, educator/guidance counselor, and workplace representative. This will be discussed in more detail later in the brief.

Finland has 10 fields of vocational education that align with career sectors: (Cedofep, 2019). Of these Engineering and Manufacturing is the most popular followed by business, administration, and law; health and welfare; and services (Finnish National Agency for Education, 2019). The least popular are social sciences and education (Finnish National Agency for Education, 2019). The 2018 VET reform aimed to improve the learner experience, help learners get credit for what they know, and improve the speed and flow of education and career pathways (CEDEFOP, 2019b; Finnish National Agency for Education, 2019). As a result, VET content is highly individualized and thus study time frame varies widely (CEDEFOP, 2019b; Finnish National Agency for Education, 2019). Each VET learner formulates a personal competence development plan free of charge in consultation with a teacher or advisor and, if needed, with someone from industry. The scope of the plan in qualifications and units is shown as competence points, where 60 points equals about a year of school. Initial VET qualifications require 180 competence points, respectively, depending on the complexity of the qualification (CEDEFOP, 2019b).

Competence development plans, which are updated as needed throughout each learner's study period, include information on learners' existing skills and skills needs as well as guidance and support needs, including language, mathematics, and digital skills training. This individual plan means that learners only study what they need to know, saving them from unnecessary coursework (CEDEFOP, 2019b; Finnish National Agency for Education, 2019). Prior learning and work experience are assessed at the start of each learner's VET program. The qualification requirements are criteria for the assessment. The legislation's point-based design allows learners to demonstrate competence in part—i.e., per unit of a qualification. Students will be awarded a certificate for the module(s) completed, which will indicate that the whole qualification will be awarded when the remaining modules have been finished.

Learners demonstrate their competences through assessments that are typically conducted in real-world work environments with the learner, a teacher, and a representative from industry present (CEDEFOP, 2019b; Finnish National Agency for Education, 2019). Competences are assessed according to national qualification requirements. Though a schedule of competence

demonstrations is outlined in the personal competence development plan, learners may request assessment when they are ready. Once all the competences in a qualification are demonstrated, it is complete.

Work-based learning components (WBL) vary by student based on a learner's competence plan (CEDEFOP, 2019b; Finnish National Agency for Education, 2019). Though there is no standardized minimum or maximum requirement with regard to work-based learning, the legislation strongly recommends VET providers organize at least part of students' learning in a workplace.

In Finland, VET does not include final examinations. Once learners successfully complete all the studies included in their personal competence development plans, the VET provider grants a certificate for the entire qualification or for one or more units of the qualification. The national qualification requirements define the required vocational competences, principles of assessment, and how the competences should be demonstrated. These qualifications are created and assigned a number of competence points by the Finnish National Agency for Education in cooperation with other stakeholders (CEDEFOP, 2019b; Finnish National Agency for Education, 2019).

There are two types of VET in Finland. Vocational Upper Secondary/initial VET programs serve youth and adults who do not have formal qualifications or those that want to change professions. Continuing VET, discussed later in this brief, provides further education to adults who typically already hold a Finnish VET qualification (CEDEFOP, 2019b; Finnish National Agency for Education, 2019).

2.1.1 Initial VET

The equitable approach to education begins early in Finland. The country provides public daycare/school for all children from ages 1 to 7. Then, from ages 7 to 16, all children complete a common comprehensive basic education. Students then choose a secondary pathway, which may be either—or sometimes both—academic (senior secondary school) or vocational (schools and apprenticeship training) (Flood, 2016). Admission into either pathway requires a basic education graduation certificate. Scholars note the importance of the equitable path in early childhood education to the success of vocational education in Finland. PISA scores demonstrate that there are few achievement gaps in the country, so when students reach age 16 they have shared a common journey and are prepared in a uniform way for next steps (Flood, 2016).

Both the academic and vocational pathways are supposed to be equal in value, and both provide access to further education (CEDEFOP, 2019b; Finnish Ministry of Education and Culture and Finnish National Agency for Education, n.d.-a). All learners who have completed basic education may enroll in VET, but in some regions, demand is greater than the availability of spots in programs. Nearly all Finnish students—95 percent—enroll in a secondary pathway, and about half of those students choose a vocational pathway (CEDEFOP, 2019). This increases

the likelihood that demand for VET will exceed capacity. For those who do not secure a spot in a program, preparatory education for vocational training (*valmentava koulutus*/VALMA) is an option. VALMA gives learners skills and assistance to apply for VET programs and helps support their chances of completing qualifications (CEDEFOP, 2019b; Finnish Ministry of Education and Culture and Finnish National Agency for Education, n.d.-b)

2.1.2 Tertiary VET

Completion of all secondary VET programs makes a learner eligible for higher education (tertiary/polytechnic) (CEDEFOP, 2019b; Finnish Ministry of Education and Culture., n.d.; Finnish National Agency for Education, 2019). To enroll in tertiary VET, students must have a VET certificate and pass an entrance exam developed and organized by the institution of higher education they wish to attend (Finnish Ministry of Education and Culture and Finnish National Agency for Education, n.d.-b). Tertiary education is optional and, once again, has both academic and vocational paths. The academic path requires students to pass a matriculation exam and meet competitive admissions standards. Providers of VET determine the selection criteria for admission into their programs.

The standard duration of an initial VET program is three years, but the competence-based structure of the 2018 legislation means that the length of training depends on the prior knowledge of the learner (CEDEFOP, 2019b; Finnish Ministry of Education and Culture and Finnish National Agency for Education, n.d.-a). Each learner's competence development plan determines the length of their study.

2.1.4 Work-based learning

The 2018 VET reforms made provisions to increase work-based learning (WBL) by offering flexibility in its delivery, abstaining from prescribing when, where, or how much content WBL programs should contain (CEDEFOP, 2019b; Finnish National Agency for Education, 2019). While WBL is typically provided in real-world work settings, it can be provided by educational institutions when this is not possible. WBL periods and conditions are defined in individual learning plans in the form of either a training contract or an apprenticeship. Under a training contract (new as of 2018), learners are not employed by the company providing the training (CEDEFOP, 2019b; Finnish National Agency for Education, 2019). They do not receive a salary, and employers do not receive any training compensation. Companies do however, recruit employees from this pool of trainees. Training agreements can be executed abroad through programs like Erasmus. Apprenticeships, which are primarily used in further and specialist vocational education, are negotiated as fixed-term employment contracts between an employer and an apprentice. It is the learner's burden to identify workplaces for their training. Apprentices have to be at least 15 years old and must work at least 25 hours per week (CEDEFOP, 2019b; Finnish National Agency for Education, 2019). Since the 2018 legislation, learners can earn their entire qualification as an apprentice. Employers are not obligated to employ apprentices after the training period. Like other VET training, apprenticeships are based on individualized learning plans and the requirements for the qualification they seek to earn

(CEDEFOP, 2019b; Finnish Ministry of Education and Culture and Finnish National Agency for Education, n.d.-a).

2.2 Teaching Requirements for VET

There are two teaching roles in VET in Finland: teacher and workforce trainer. The positions and qualifications for those positions are described in the section below.

2.2.1 Teachers

Teachers in the Finnish VET system are well paid. The positions are highly sought after and selective (CEDEFOP, 2019b; Finnish National Agency for Education, 2019). There are two kinds of teachers at VET institutions those that teach VET and conduct competence assessmemnt and those that teach common subjects. Common subject teachers might teach courses like language, math, or science. There are also special needs teachers (Finnish National Agency for Education, 2019).

VET teachers must have an appropriate higher education qualification for their VET sector (this varies but can be a master's degree), a minimum of three years of work experience in the field, and have completed pedagogical teacher training (CEDEFOP, 2019b; Finnish National Agency for Education, 2019). If an appropriate degree does not exist other qualifications can be used. These requirements mean that applicants and those admitted for VET teaching positions are typically older than other teachers; in fact, the average age for a VET teacher in Finland is 40 (CEDEFOP 2019b; Finnish National Agency for Education, 2019). They can also make it challenging to find qualified VET teachers in some regions. As a result, some VET fields have developed an alternate path for teachers to qualify, such as the completion of a specialist vocational qualification (CEDEFOP, 2019b; Finnish National Agency for Education, 2019).

Pedagogical training is updated continuously by vocational teacher education colleges, which is one way that VET is kept up to date. While the 2018 legislation contains some guidelines regarding what this should look like, colleges have a good deal of autonomy in both their curricula and training arrangements (CEDEFOP, 2019b).

Teacher skills are kept up to date through in-service trainings and professional development. Teachers are supposed to do 5 days of professional development each year, although a recent survey suggests that participation may be declining (Finnish National Agency for Education, 2019). Professional development for teachers is defined partly in legislation and partly in the collective agreement negotiated between the Trade Union of Education in Finland and the employers' organization (CEDEFOP, 2019b). Funding for this professional development is the responsibility of the training providers. The training is free for teachers, and they get paid for their participation. These trainings are meant to be focused on current education policy, but training providers have a good deal of autonomy in what is taught (CEDEFOP, 2019b).

In addition to these trainings, VET teachers are encouraged to participate in professional development in real-world workplaces (CEDEFOP, 2019b; Finnish National Agency for Education, 2019). This has multiple benefits. Teachers stay up to date on new technology and practices while helping to enhance cooperation and collaboration between the education and business sectors and generating opportunities for work-based learning and employment for students (CEDEFOP, 2019b; Finnish National Agency for Education, 2019).

2.2.2 Trainers

Workplace instructors or trainers are typically experienced foremen and skilled workers. There are no formal qualification requirements to be a trainer, but they often have a vocational or professional qualification. It is likely, however, that they hold no pedagogical qualifications (CEDEFOP, 2019b).

Trainers are not required to do professional development, but there are programs available to them. These are aligned with national guidelines from the Finnish Agency for Education and provide information on planning trainings, how to performan competence demonstrations, how to assess learning, and how to teach VET skills (CEDEFOP, 2019b). It is recommended that people who serve as trainers participate in one of these courses. Once again, the VET education providers are responsible for funding this training.

2.3 Student Recruitment & Enrollment

2.3.1. Financial Incentives

As noted above, the Finnish system is designed around the idea of equal opportunity for all in education. To promote this idea, most education is free for learners from age 1 through higher education (CEDEFOP, 2019b). Additionally, reskilling opportunities are also provided at no cost to the learner. Financial supports are available for learners of all ages that provide an incentive to study, upskill, and reskill.

Full-time VET students get a variety of financial supports including study grants, housing supplements, transportation subsidies, and government guarantees for student loans. Study grants become available when childhood grants expire at age 17 (CEDEFOP, 2019b). They are paid monthly and vary in amount based on age, marital status, and what is being paid for. Housing and transportation supplements may also available.

Upper secondary education is free of charge for all learners, but students are responsible for buying learning materials, which in VET may include books, technology, tools, safety equipment, etc. Some students can get support dollars for these supplies based on age and income.

Incumbent workers who have been in a job for a year are entitled to study leave. This leave is unpaid. Funding for education is available to both employed and self-employed adults for a

study leave of up to two months. An adult education allowance is available to employees and self-employed people. This is a legal right and can be given to any adult with at least an eight-year work history. The allowance, the amount of which is based on earnings, can be used towards vocational training and qualifications.

2.3.2 Promotion of VET

Throughout the 21st century, Finland has focused policy efforts on creating interest in vocational education at the secondary level (Meriläinen, 2019). This outreach has resulted in increased participation over the last few decades from 30 percent to nearly 50 percent of secondary school students. Scholars attribute this increase in enrollment to a nationwide appreciation for vocational training due to policy and practice efforts to develop strong curricula and training structures (Meriläinen, 2019). One specific reform that receives substantial credit is the decision to open a pathway to higher education from VET (Meriläinen, 2019). Another important reform was the move toward qualifications that include the opportunity to demonstrate competences, which has led to faster completions (Meriläinen, 2019).

Another important reason students enroll in secondary VET is advising. Finnish students receive guidance and counseling for the entirety of their basic education career. Guidance counselors help students with their plans for further education and training and help to coordinate work experience modules and visits to workplaces. In addition, while not part of the official education system, Finland conducts about 260 youth workshops with over 20,000 participants each year. Lasting for about six months, young people in these workshops receive employability as well as work-based training, which helps students gain practical experience in vocational education, explore their career options, and develop relationships with potential employers before moving on to initial VET. There have also been some examples of companies collaborating with VET institutions on marketing campaigns that target students to potentially fill anticipated gaps in the company's workforce (Laukia et al., 2017).

2.4 Adult Education and Retraining

Continuing VET is available for incumbent workers and the unemployed. In-service training is employee training paid for by the employer or a trade union. Employees are compensated to attend this kind of training (CEDEFOP, 2019b).

Vocational labor market training is typically for unemployed adults or those at risk of losing employment who have finished basic education. This training, which typically results in a vocational qualification, is offered in a variety of sectors and is provided at no cost to the learner. Providers include vocational adult education centers, higher education institutions, and private education institutions (CEDEFOP, 2019b).

2.5 Funding

For the learner, VET is free, for the most part, and participation includes financial supports as noted above. Specialist qualifications can be the exception to this (CEDEFOP, 2019b). VET programming is funded by national and local governments as part of the state budget. Private funding for VET currently remains under 5 percent of the total national expenditure. The criteria for funding allocations from the state are the same for all public and private VET providers. Since the Act on the Financing of the Provision of Education and Culture (532/2017) created a single funding system for all VET programs, the training providers do not impact funding criteria (CEDEFOP, 2019b). By 2022, this will become operational, and funding will be divided into a variety of new categories to help promote innovation, alignment to the labor market, and work advancement.

3. Content

3.1 Curriculum Development/Labor Market Alignment

Finland has a national qualifications framework that is regularly updated every 5 to 10 years to align with anticipated skill needs and labor market conditions. The National Agency for Education leads the development of qualification requirements in consultation with employers, employees, self-employed people, and education providers (CEDEFOP, 2019b)

3.2 Skills

The 2018 reform identified eight key competences that are now included in all vocational skill and assessment requirements. These include (1) digital and technological; (2) mathematics and science; (3) competence development; (4) communication and interaction; (5) sustainable development; (6) cultural; (7) social and citizenship; and (8) entrepreneurial (CEDEFOP, 2019b). Soft skills are included in this instruction. Language skills are also a priority in Finnish VET.

4. Other Key Findings

In 2017, over half of all students who completed a vocational upper secondary qualifications were employed within a year of graduation (Finnish National Agency for Education, 2019). A 2017 study found that the fields with the highest employment rates post-graduation are education, health and welfare, and business administration and law (Finnish National Agency for Education, 2019). Graduates with specialist vocational qualifications have the highest employment rates. This is especially true for those that came from apprenticeships. This can likely be explained by the fact that many had a job prior to starting their studies and may return to it when they complete (Finnish National Agency for Education, 2019).

International experiances are an important part of Finnish VET. Many VET students do a part of the qualification in another country. The goal of this is to give students an experiences and skills that will serve them in the globalized workforce. International students also come to

Finland to study VET, most typically from Germany and Spain but increasingly from Asian countries as well (Finnish National Agency for Education, 2019). These experiences help to improve employment prospects for students, as do having language skills, particularly in Swedish.

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Appendix E- Spain Country Brief

Justin Vinton, Heather McKay, James Boyle

1. Introduction

This section will provide an overview of Spain's Vocational Education and Training (VET) system. The 1978 Spanish constitution identifies vocational education as a right for both citizens and foreign populations. VET is outlined and organized via a federal policy, Act 5/2002 (Sancha & Gutiérrez, 2019). The Act defines VET as "the set of training activities that prepare people for qualified performance in diverse occupations [and] access to employment and active participation in social, cultural and economic life" (Sancha & Gutiérrez, 2019). It provides the framework shaping Spain's VET system by outlining the tools and actions for the development and promotion of VET as well as the processes for the assessment and validation of skills and competences acquired both formally and informally.

Vocational education in Spain is structured under two federal agencies: the Ministry for Education and Vocational Training and the Ministry for Labour, Migration, and Social Security. Of note, our interview respondents spoke about some recent attempts to combine VET development and administration under the same ministry for the sake of efficiency (Sancha & Gutiérrez, 2019). VET programming is addressed at three stages: initial skilling, upskilling, and reskilling (Sancha & Gutiérrez, 2019). Initial skilling resides under the Ministry of Education and takes place within the traditional education system. Though this stage of VET is primarily focused on youth, there are opportunities for adults to access the training and achieve a qualification. Upskilling and reskilling are focused on incumbent workers and the unemployed. This training typically resides under the purview of the Ministry for Labour, Migration, and Social Security. State-run schools are the primary providers of VET at all stages. The different training types are described in more detail below.

Overall, our interview respondents described the VET system in Spain as largely centralized and primarily school-based but noted that the federal government delegates key responsibilities to the local state governments, which have flexibility to adapt and change VET programs to meet regional needs and goals. As such, VET implementation varies somewhat across Spain's 17 regions and 2 autonomous cities.

2. Structure

As noted above, VET programs fall under two ministries in Spain, and thus two systems: the education system and the employment system. In this section we detail the programs and pathways that fall under the traditional education system and those that serve workers.

2.1 Education and Career Pathways

The Spanish VET system has multiple entry and exit points as well as a variety of education and career pathways. One of the hallmarks of the Spanish system is that no matter the path students take through the system, in the end they receive similar marketable certificates. VET certificates are marketable across Spain regardless of where or how they are obtained. This makes Spain's VET system among the most flexible in Europe from the learner's perspective. It also offers some of the shortest pathways to a VET qualification among the countries in this study, as most programs at both the secondary and tertiary levels are designed to be completed in two years or less.

The VET system in Spain has three levels: basic (lower secondary), intermediate (upper secondary), and higher (tertiary) (Sancha & Gutiérrez, 2019). These three levels and the pathways from them to employment and further education (both academic and VET) will be described in more detail below. The majority of training (75%) takes place at state schools, but other providers can offer this training, including national reference centers, which are public institutions dedicated to various professions that are tasked with innovation initiatives in VET, and accredited private and integrated training centers (Sancha & Gutiérrez, 2019). This schoolbased VET system was established in 1970 via legislation developed in response to a decline in apprenticeships. The law was enacted with the goals of democratizing access to education to meet changing global demands and modernizing the almost century-old traditional educational system (Martínez-Morales & Marhuenda-Fluixá, 2020). The visibility of VET in Spain is also significant since VET programs are largely administered in traditional academic secondary and post-secondary schools. Thus, they are considered equally as attractive as academic pathways beyond compulsory education, especially given the more than 60 intermediate VET qualifications compared to the 5 academic qualifications available. In fact, there are over 150 qualification and program options for VET including secondary and tertiary education (Martínez-Morales & Marhuenda-Fluixá, 2020).

2.1.1 School-Based VET

School-based VET programs at all levels typically require 2,000 hours of learning over two academic years at VET schools as well as a module of work-based learning at a company (Sancha & Gutiérrez, 2019). The timeframe of work-based learning can vary from 240 hours in basic VET to 400 hours in higher VET programs. Students with previous work experience may be exempt from this requirement. All VET programs can be completed full time or part time in a modular format (Sancha & Gutiérrez, 2019; Martínez-Morales & Marhuenda-Fluixá, 2020). Modular options were developed to provide flexibility for work and family, and as a result, programs can sometimes take longer than two years. Distance learning has also become more prevalent in VET training in recent years, and our interview respondents suggested this trend accelerated during the pandemic. Even with remote learning options, however, some students may face challenges fulfilling their required work-based learning hours under COVID-19 restrictions.

Compulsory education in Spain has two stages that do not include vocational education. The first stage includes early childhood and primary school and lasts until age 12. Students then move on to the second stage, lower secondary education, which they attend from ages 12 to 16. This results in a lower secondary education certificate (*título ESO*) (Sancha & Gutiérrez, 2019). Earning this credential gives students pathway options including high school (*bachillerato*), intermediate VET (*FP de grado medio*), or employment. If students do not complete lower secondary education, they get an official certificate of compulsory education with information about the years of study they have completed and their grades. A pathway to VET, called Basic VET, was created in 2013 for students who do not hold a lower secondary education certificate (Sancha & Gutiérrez, 2019).

Basic VET (*FP Básica*) is an alternative VET pathway that starts at the lower secondary level and is open to ESO students 15 years of age or older who meet a set of academic requirements (Sancha & Gutiérrez, 2019). Basic VET results in a diploma that provides access to typical VET pathways, including employment or further education. The program offers 34 different qualifications (Martínez-Morales & Marhuenda-Fluixá, 2020), takes two years, and includes 2,000 hours of theoretical and practical training. Of these, at least 240 hours are work-based and completed in conjunction with employers. Basic VET students may also be able to earn their full lower secondary credential (*título ESO*) by taking an exam or receiving a favorable decision from program teaching staff, giving them access to upper secondary general education (Sancha & Gutiérrez, 2019).

Traditional VET tracks in Spain begin in upper secondary education (Sancha & Gutiérrez, 2019). At 16, students may choose to enter the general academic pathway through high school (*bachillerato*) or to enter the vocational pathway through intermediate VET. As noted above, neither of these options is compulsory. Students in high school are typically between the ages of 16 and 18. High school consists of two academic years and results in a diploma (*título de Bachillerato*). After earning this diploma, students can progress to post-secondary VET programs or university or may choose to enter the labor market. Students in intermediate VET programs are also typically between the ages of 16 and 18 (Sancha & Gutiérrez, 2019). These programs are comprised of 2,000 hours of school-based study followed by a 3-month module of training with local employers (Lopez-Mayan & Nicodemo, 2015). Students can have their workplace training requirement waived if they have a year of work experience related to the content of their program (Lopez-Mayan & Nicodemo, 2015). Upon completion of intermediate VET, students are awarded a Technician diploma (*título de Técnico*) in a specialty area (Sancha & Gutiérrez, 2019). Since 2016–17, this diploma has provided access to higher VET programs or employment (Sancha & Gutiérrez, 2019).

2.1.2 Dual VET (Apprenticeship)

In 2012, the range of options available to Spanish learners was expanded even further when Spain began implementing a dual VET model that offers paid apprenticeships in the intermediate and higher levels of VET education. Dual VET programs are evaluated by VET schools with input from employers and result in a similar certificate to the traditional training models noted above. Dual VET programs provide an alternative to the traditional model and increase inclusivity by addressing both alternate learning styles and the need of many to earn money while in school. They represent an attempt to promote employment among youth and to provide them with wages while they work toward a vocational qualification (Sancha & Gutiérrez, 2019).

There are two ways that Dual VET can be offered (Sancha & Gutiérrez, 2019). In the first model, students enter an apprenticeship contract with an employer and split time between school and the workplace such that a minimum of 33 percent and maximum of 85 percent of their time is spent with the employer after a certain amount of school-based education has been reached. The second model involves employer-sponsored trainings tailored and implemented regionally to respond to local needs. The contracts are typically one to three years long and must be aligned with the VET pathways and credentials described above. Student assessment is still the primary responsibility of teachers and the VET school, with consultation from employers (Sancha & Gutiérrez, 2019).

Despite being designed with outreach and inclusivity in mind, the dual VET program has not proven to be popular among Spanish learners; in fact, in 2016–17, just 3 percent of all VET students were enrolled in a dual VET program (Sancha & Gutiérrez, 2019). Interview respondents noted that the low uptake in these programs may be due to a lack of available opportunities; employers may prefer and encourage the school-based approach because Spanish firms are typically small and may lack the resources of larger, more capital-rich firms in other countries to offer apprenticeships. It may also be due to a lack of collaboration with key stakeholders. Some have argued that the dual VET system has stagnated because it was a topdown initiative advanced by neoliberal proponents in the federal government and was neither strongly demanded by nor coordinated with Spanish employers, unions, or VET schools (Martínez-Morales & Marhuenda-Fluixá, 2020). It is worthwhile to note, however, that research from Spain found that workplace training increases exit to employment and permanent job placement from both vocational high school and vocational college, especially when it is combined with previous labor market experience (Lopez-Mayan & Nicodemo, 2015).

2.1.3 Post-Secondary and Tertiary Pathways

Higher (post-secondary or tertiary) education includes both academic and vocational options. There are more than 70 qualification program options in higher VET (Martínez-Morales & Marhuenda-Fluixá, 2020). These involve 2,000 hours of work, 400 of which are work-based learning hours typically divided over two academic years. Completion of a VET qualification program results in a Higher Technician diploma (*título de Técnico Superior*) and can lead to either related university studies or employment (Sancha & Gutiérrez, 2019). University studies can include enrollment in a bachelor's, master's, or even a Ph.D. program. As is clear from the various levels and the multiple entry and exit points of the fairly traditional and school-based models discussed thus far, Spain's VET system is designed to be flexible for the learner.

2.2 Teaching Requirements and Flexibility

VET teaching requirements are generally uniform throughout the country. The dual track is an exception to this—company instructors do not need qualifications for teaching. Additionally, requirements vary based on the type of training to be carried out. If that training is included in the National Catalogue of Occupational Standards, then it is guided by professional certificate regulations (Sancha & Gutiérrez, 2019).

Teaching requirements for school-based settings are outlined in the 2006 Education Act, though some modifications to these requirements were made as part of the 2013 Organic Law for the Improvement of Educational Quality Act (European Commission, 2020; Sancha & Gutiérrez, 2019). Requirements typically include a university degree, a master's degree in teacher training, and a period of internship training at a VET institution. Teachers must also participate in career and professional development activities. These activities are aligned with career and wage progression (Sancha & Gutiérrez, 2019). Professional development activities, requirements, and availability differ by region and can be completed in a variety of ways. Regions often tailor professional development to their local areas. For example, in the Basque region, teachers are required to complete a Transfer of Knowledge Program that is largely coordinated by VET network hubs in the region. Our respondents described how these professional development requirements encourage teacher innovation by keeping them up to date on new practices in the field, technology changes, and shifts in labor market demands and skill needs. Teachers may also choose to train onsite at a company, thus promoting links between business and the education sector. In this way, teachers are not only teaching but also looking at what can be improved in the field and how to generate and communicate new kinds of knowledge.

In addition to regional approaches, there are also national resources for professional development. The Institute of Education Technologies and Teacher Training develops and makes available educational resources for teachers. They often collaborate with regions on their materials and resources (Sancha & Gutiérrez, 2019).

2.3 Student Recruitment

In Spain, VET pathways are considered less prestigious than the university pathway. Though there have been attempts to confront that stigma, choosing an academic or vocational pathway in Spain, like in other places, remains linked with social and cultural attitudes. There is some evidence from both the literature review and our interviews, however, that this may be changing (Fundae, 2019). Data from the 2019 CEDEFOP report by Sancha and Gutiérrez (2019) show that the number of VET students has increased in recent years. Thought leaders in the field attribute this to a variety of different factors including the Great Recession, better linking of VET to employment opportunities locally, and efforts by the national and regional governments to improve VET system participation. Sancha & Gutiérrez (2019) identified the following policy and practice measures that contributed to VET enrollment:

- Strategic design and implementation of a flexible system with multiple entry and exit points and opportunities for further education throughout.
- The launch of new kinds of programming to improve pathways and options for youth and at-risk youth (e.g., Basic, Dual VET).
- Efforts to maintain VET's alignment to the labor market and changing technologies through professional development for teachers, keeping teaching facilities and tools up to date, and offering work-based learning opportunities.
- Expanded scholarship and grant opportunities.

In addition to these policy and practice tools, the education ministry also advertises VET programming and provides guidance about VET options and programs through a wellmaintained web portal (www.Todofp.es). Funding for participants, social security contribution breaks for companies, and other financial incentives are intended to drive participation. Additionally, flexible delivery and supports for transportation and other costs help support enrollment and completion. Both public and private training providers can also receive supports (Sancha & Gutiérrez, 2019).

Despite the many policy innovations addressed here, more and greater efforts will likely be needed in this area due to the current state of affairs caused by COVID-19 and to meet changing, and increasingly challenging, global demands.

2.4 Adult Education and Retraining

Vocational training for both employed and unemployed adults over 18 is led by the Ministry for Labour, Migration, and Social Security under Act 30/2015, which reformed vocational training for employment. The goal of this continuing VET is to support personal development, upskilling, and employability of the workforce, support accreditation of skills acquired through training and work experience, and align workers' training with labor market needs (Sancha & Gutiérrez, 2019). The responsibility for central accreditation and administration of adult VET falls under the Ministry; however, governance and control is largely delegated to the regions to develop localized training provisions (EAEA, 2011). A wide range of training falls under this umbrella, from upskilling members of the current workforce to training those who are unemployed or have not earned traditional educational credentials. Continuing VET programs targeted toward unemployed workers are directly linked to obtaining a full or partial occupational certificate (*certificado de profesionalidad*/CdP) and as such are listed in the CNCP (Sancha & Gutiérrez, 2019). More broadly, adult and continuing VET is usually delivered in person, but our interviewees report that remote options have become more common in recent years, especially during the pandemic.

Historically, both worker and employer groups have held significant power as training providers. However, reforms in 2015 allowed private accredited training providers to

participate directly in the design and provision of training programs, undermining some of the traditional influence of trade unions and employers (European Commission, 2015).

VET training in the employment system also includes pathways and tools aimed at youth employment that may or may not be linked to occupational certificates. They may include training for students to take prior to entering VET if they do not meet required entry competences. There are also general or specialized training programs that do not lead to a formal qualification. Depending on what is being offered, training organized by companies and sometimes sectoral training falls into this category as well because it is often created around a very small set of skills or competences (Sancha & Gutiérrez, 2019).

In addition to its training pathways, the employment system in Spain has national- and regional-level processes for assessing prior or informal learning built into its VET programming. The national public employment service (SEPE) and regional employment services can issue partial (competence units) or full occupational certificates for competences demonstrated. These certificates are official and can be used throughout Spain (Sancha & Gutiérrez, 2019). Further, students who have one full year of relevant work experience may be exempt from the normally required workplace training modules in both vocational high school and bachelor's programs (Lopez-Mayan & Nicodemo, 2015).

3. Content

3.1 Curriculum Development and Standardization

There is significant coordination among societal stakeholders, including employers and unions, to develop VET curriculum. This makes the VET system unique in that there is a lack of engagement from these parties in the traditional academic education system (Martínez-Morales & Marhuenda-Fluixá, 2020). VET curriculums are developed centrally by the ministries of labor and education along with the three social partners. Of note, our respondents stated that labor unions and their associations play an advisory role. Although there are centralized standards and qualifications that are recognized throughout Spain, VET administration is largely delegated to the local areas. Our respondents noted that the local governments coordinate directly with employers and seek input from unions. Further coordination among VET stakeholders happens at the institutional level. Some VET schools have agreements with local employers to host trainees for the mandatory training requirement of VET programs. This simplifies the process for their students, who do not have to search for these work-based learning positions themselves (Lopez-Mayan & Nicodemo, 2015).

Despite the comprehensive framework for recognizing qualifications across Spain, the last central changes to curriculum were made about 13 years ago, and our respondents noted that updates are needed, especially due to the changing nature of the manufacturing industry. In fact, although regional governments, VET schools, and employers have some flexibility to change localized curriculums, interview respondents indicated that VET schools have asked the

central government to change the general curriculum, which they believe is outdated for the current labor market.

3.2 Funding

Governance and funding streams for VET vary depending on who is being trained, but if students or employees are attending public schools for VET, it is free to attend. For VET provided through the education sector, public funds are provided mainly by the education ministry and regional education authorities (Sancha & Gutiérrez, 2019). This type of VET receives much less funding from employers, who may still largely see VET as a cost rather than investment (Martínez-Morales & Marhuenda-Fluixá, 2020). Some funding comes from the business sector indirectly as part of the state funding stream collected through taxes levied on all private companies as a social security contribution.

Adult and continuing VET and reskilling for the employed and unemployed falls under the responsibility of the employment ministry and regional governments of Spain and is free of charge to students or workers (Sancha & Gutiérrez, 2019). The quantity of funds provided to each region is fixed through agreements. Employment VET for employed workers is managed by the State Foundation for Training in Employment and the Spanish State Employment Service or, if they are regionally based, by the regional labor authorities. Training for unemployed workers is typically managed by regional training authorities. Funding for employment VET typically comes from a training tax on private companies through social security. Some funds also come from the European Social Fund and the National Employment Service. Allocation of resources in the country and regions typically occurs in annual budgets (Sancha & Gutiérrez, 2019).

3.3 Skills and Primary Industries

Many of the state-run VET schools' offerings are geared toward the service sector because they require low investment in technology and can be more easily delivered than programs that require major investments in expensive technological infrastructure and equipment (Martínez-Morales & Marhuenda-Fluixá, 2020). Indeed, Department of Education data from 2019 show that over 60 percent of students enrolled in intermediate VET were on pathways leading to service occupations, while over 67 percent of students in upper level VET were on service-oriented pathways (Ministry of Education and Vocational Training, 2019).

Finally, our respondents noted that in Spain, as in other places, employers complain about the lack of recent graduates' soft skills. As a result, there has been a large push within the VET system to focus on developing these skills in the country's workforce. Beginning in 2013, specific centers were opened to structurally incorporate soft skills development into Spanish VET. One such center in the Basque region, called IDEATK or iTalent, is dedicated to innovation and skills development in creative fields.

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Appendix F – Denmark Country Brief

Heather McKay, James Boyle, Justin Vinton

1. Introduction

This section will provide an overview of Denmark's VET system, which involves the social partners of employers, firms, and the state as well as other stakeholders like VET schools, teachers, and students. Since 1980, the VET system has been undergoing reforms aimed at making it more simple, democratic, and flexible. The latest legislation, enacted in 2007, improved the individualization of learning for both strong and weak learners and combined all initial VET programs under the same law. It also increased modularization of programs by allowing partial qualifications, which created numerous exit points to the labor market as well as re-entry points back into VET programs (CEDEFOP, 2012).

Denmark's unique labor market system, informally known as "flexicurity," is strongly incorporated into the country's VET system. In this system, employers accept unionized workplaces and engagement but maintain strong control and discretion over firing and hiring. Meanwhile, people seeking employment receive comprehensive government benefits that include education, training, retraining, and counseling services (Ministry of Foreign Affairs of Denmark, 2021).

As the nickname implies, flexibility as a key proponent of the Danish economy and education system. This is reflected in the government's favoring of short periods of reskilling throughout the life of a learner over investment in long-term education for unemployed workers and adults. This emphasis on lifelong, flexible learning in Denmark is also exemplified at the level of initial education, when learners may choose from among five different upper secondary VET programs, as well as in the multiple options available for adult and continuing VET (Andersen & Helms, 2019) that are designed to provide options to both strong and weak learners (Ibsen & Thelen, 2020). Focusing on the weakest learners was part of a state-led initiative launched in the in the 1990s called "Education For All," which aimed to have at least 95 percent of young students complete upper secondary education and obtain a credential (Jørgensen & Juul, 2009). Further, in 1993, Denmark's government shifted away from an apprentice-based VET model to pursue school-based VET to address issues of accessibility as well as a lack of students able to attend training placements (Ibsen & Thelen, 2020). Although originally intended as temporary to counteract apprenticeship shortages, school-based VET became a popular alternative to apprenticeship training and was therefore expanded and fully integrated into the VET system (Ibsen & Thelen, 2020).

2. Structure

2.1 Education and Career Pathways

Danish children attend basic compulsory schooling from preschool to 9th grade, beginning around age 6. After completion of compulsory schooling and exit examinations around age 16, students have the option of attending 10th grade as a planning year to gain clarity on their career path before entering general or vocational upper secondary education. At the upper secondary level (grades 10–13), Denmark offers students one primary VET program with numerous qualifications and specializations available, and another program that combines both VET and general education and can lead to similar qualifications, as well as other alternative shorterterm VET programs leading to qualifications (Andersen & Helms, 2019). All these programs are provided by dedicated VET colleges, optional, and free of charge. Each available VET or general education program has multiple, but different, pathways to the workforce and to higher education that may take anywhere from three to five years to complete. All have partialqualification options and multiple exit ramps to the workforce (Andersen & Helms, 2019). Each of these programs will be discussed in detail in the following section.

Though VET in Denmark is now primarily school-based, each of the initial VET programs align with the dual system model and require some mix of college-based learning and workplace training. The usual ratio of time spent at a workplace and time spent at a VET college is 2:1, though this varies across qualifications (Andersen & Helms, 2019). According to interviewees, these individualized and flexible programmatic options offering numerous alternative pathways for gaining skills and reaching employment are intentionally designed into the VET system to cater to both strong and weak learners. Additionally, a significant education reform was passed in 2015 and subsequently implemented in 2017 to improve the teaching of general skills and evaluations, simplify and increase the accessibility to both VET and general education, and combine both kinds of education and training through mixed classes (Andersen & Helms, 2019).

2.1.1 School-Based VET

Administered primarily by state-run but locally flexible public VET institutions, there is one main initial VET program in Denmark at the upper secondary level (now named *erhvervsuddannelse;* EUD) that offers numerous qualification options to students directly from lower secondary school as well as to students who completed lower secondary school two or more years prior and want to return for more specialized training (EUC Syd, 2020). Before the 2015 reform, students were able choose from among 12 groups of foundational courses that lasted anywhere from 20 to 116 weeks (CEDEFOP, 2012). Under the recent reform, the newly named EUD is more streamlined, offering four areas of broad specialization: care, health, and pedagogy; office, trade, and business service; food, agriculture, and experience; and technology, constructions, and transportation. Otherwise, it has largely remained the same. Foundational courses are intended to provide students with broad vocational skills and requisite knowledge to choose an appropriate specification for further education on a career pathway. Completion of

any one of these groups of courses in itself does not provide a qualification for the labor market; rather, it provides access to over a hundred different specialized main programs that can lead to a full VET degree qualification (CEDEFOP, 2012; Andersen & Helms, 2019). During this second stage of the program, on-the-job training is required (e.g., apprenticeship or similar practical training at a VET college), while certain specializations, or steps, can be achieved before full completion of a program (CEDEFOP, 2012). Reaching these steps allows students to enter into the labor market while only having completed a partial qualification that corresponds to a specific skilled position in the labor market. Students may re-enter their previous VET program at a later date to complete the full qualification. Including specializations, there are 301 main VET qualifications available across programs (CEDEFOP, 2012; Andersen & Helms, 2019).

Speaking to educational flexibility and the emphasis on an education for all (Jørgensen & Juul, 2009), students who struggle or fail in apprenticeships (discussed in detail in the next section) have the option to complete their training through an alternative school-based program (*skolepraktik;* SKP) that provides weaker students with a second chance at success (Ibsen & Thelen, 2020). SKP takes place at practice centers (*praktikcentres*) that provide a variety of apprenticeship-style training provided by arrangements made between multiple employers and the practice centers, though employers play a small role (Ibsen & Thelen, 2020).

This concern for the needs of weaker learners is part of broader efforts in Denmark to focus on lifelong learning (Ibsen & Thelen, 2020). Indeed, Danish VET offers other methods of learning for all skill levels. Four upper secondary level alternatives that can lead to VET qualifications include combined VET and general upper secondary education (EUX), basic vocational training (*Erhvervsgrunduddannelse*/EGU), schools of production, and youth education for young people with special needs (STU) (CEDEFOP, 2012; Andersen & Helms, 2019).

Introduced in 2010, EUX is designed for students who want the most flexibility to access different pathways and are willing to dedicate more time to training than it takes to complete the main initial VET program (CEDEFOP, 2012). This program, which was designed to broaden the appeal of VET (Ibsen & Thelen, 2020), can result in a combined vocational and general upper secondary qualification—a journeyman's certificate and general education diploma (Andersen & Helms, 2019; Ibsen & Thelen, 2020). Students who receive this combined EUX qualification may enter the labor market or choose to pursue tertiary-level training, including a general bachelor program, professional bachelor program, or an academy profession program (CEDEFOP, 2012). As part of the 2015 education reform to broaden student interests and options at earlier ages, the EUX has been a strategic priority of Danish VET, and therefore has been incorporated into business programs, social/healthcare programs, and other technical VET areas (Andersen & Helms, 2019).

Also flexible, the basic vocational training EGU program is designed for unemployed people under 30 who are unable to complete other forms of education or get a job; it is intended to provide individualized practical vocational and personal skills without requiring much theoretical study (Andersen & Helms, 2019). The program typically takes two years to complete and leads to a qualification that is recognized on the labor market or can be transferred to the main VET program. In line with the dual principle, it features both real-world and school-based training. Two-thirds of students' time is spent on a paid workplace training component at a host firm, while the other third is spent at one of numerous vocational colleges focused on different fields (CEDEFOP, 2012).

Adding to Denmark's emphasis on individualized training for all kinds of learners, independently led schools of production are intentionally designed for students under the age of 25 who have not completed upper secondary education or have had difficulty on the job market. Students attend these schools for up to one year, receiving hands-on training, optional theoretical education, and active guidance in career pathway options. Although they earn a qualification certificate upon completion, they are not required to take exams and are not given grades (CEDEFOP, 2012). Most students come from compulsory lower education or have taken a foundation course in the main VET program but have not completed a specialization (Andersen & Helms, 2019).

Additionally, since 2007, students between the ages of 16 and 25 with special needs also have the opportunity to enter a specialized VET program (STU) if they have difficulty completing a different upper secondary program. Local governments are required by law to offer special needs students a three-year program after compulsory schooling that is designed in coordination with youth guidance services, parents, and students. Typical programs mix elements of practical, vocational, and general education (Andersen & Helms, 2019; CEDEFOP, 2012).

2.1.2 Dual System (Apprenticeship)

Since 2006, Danish students have the option of completing the main initial VET program by entering directly into an individualized apprenticeship contract with a host company instead of completing one of the foundation course sequences discussed above. Introduced as a way to reduce VET dropout rates by offering greater flexibility, this "new apprenticeship" (*ny mesterlære*) is an appealing option for students who are struggling or are disinterested in theoretical school-based education. Apprenticeships are developed in coordination between the employer, the student, and the college as a personalized education plan based on the competences of the related main program (CEDEFOP, 2012).

Employers wishing to take on an apprentice must be certified by the VET institution that the potential apprentice is enrolled in and enter into one of three contract agreement options: an ordinary apprenticeship in which one employer hosts an apprentice; a combination agreement in which two or more employers host an apprentice; or a short-term agreement in which an employer hosts an apprentice for a student during one or more parts of a given program's main course, which may also be extended to an ordinary apprenticeship (Evu, n.d.).

According to our interviews, apprenticeship contracts are paid and last between two-and-a-half and four years depending on the program. More recently, in line with the education reforms, these new apprenticeships have become available in most parts of EUD, except in certain industries whose trade committees have opted out, like electrical and plumbing (Andersen & Helms, 2019). Interviewees suggested that employers have the primary educational responsibility for apprentices, though VET schools work closely with both students and employers.

Further, reflecting on the school-based nature of Danish VET, Ibsen and Thelen (2020) explain in their study that apprenticeship placements have stalled over the past few decades, while most firms in Denmark that offer apprenticeships are smaller and less influential than larger firms who tend to recruit from general university programs. Consequently, they argue, training innovations for advanced skills that large and leading employers are seeking in Denmark have been created outside the school-based VET system and are disconnected from it.

2.1.3 Tertiary VET Pathways

The EUX is the only upper secondary VET programs to provide direct access to universitybased academic (i.e., non-professional) degree programs. However, students who have certain other upper secondary VET qualifications (e.g., EUD qualification) and/or work experience have numerous short- and longer-term options to gain additional specialized skills in a tertiary VET program. The shortest tertiary program is a two- or two-and-a-half-year work-based program (*kort videregaendeuddannelse*/KVU) offered by business and technical academies that confers an academy profession degree (*erhvervsakademigrad*/AK) after completion (Andersen & Helms, 2019). Completion of the KVU can grant access to additional diploma-degree programs that can then lead to a bachelor-equivalent degree. There are 40 KVU and affiliated diplomadegree programs, which range from laboratory technician to multimedia designer (CEDEFOP, 2012)

Some university colleges offer three- to four-year programs that result in a professional bachelor's degree. There are almost 80 options for professional bachelor's programs, which range from midwife to software developer, and completion can grant access to master's-level programs. (Andersen & Helms, 2019). Additional opportunities exist for students in general higher education seeking vocational skills to transfer into a VET program.

2.2 Teaching Requirements for VET

There are two different types of teachers within VET colleges—vocational subject teacher and general subject teacher. Prospective vocational subject VET teachers must have passed their own vocational degree training and usually must have five years of work experience in the area they teach. They may also be required to receive a diploma in a vocational pedagogy program (UddannelseGuiden, 2021). According to our interviewees, a teacher may be further required to have a secondary degree in a subject such as Danish or math. General subject teachers must have a bachelor degree in teaching, a background in traditional school teaching, plus at least two years of experience teaching in their content area (UddannelseGuiden, 2021); most come from either university or have a professional bachelor degree (Andersen & Helms, 2019). There

is not always a requirement for teachers to have pedagogical training for employment, however. Part-time in-service training is provided by the state-run body on pedagogy through VET colleges or AME centers. That program results in a tertiary-level diploma degree in vocational pedagogy and must be completed within six years. (CEDEFOP, 2012).

2.3 Student Recruitment and Enrollment

Recent updates to flexicurity have come into play with the support of the three social partners (state, employers, and unions) that include enhanced efforts to increase the supply of labor by incentivizing Danish citizens to seek VET training. These updates include a requirement for anyone unemployed and under age 30 to take part in some form of education or training (Andersen & Helms, 2019). Additionally, according to interviews, students can be recruited to VET programs as early as when they begin their secondary education, largely by employers who may even agree to an apprenticeship contract with students directly upon their entry into a vocational training program Although there is a national strategy to recruit youth into vocational school, there is room for improvement in this area, as student participation and retention in VET programs remains low; enrollment, in fact, has recently been declining. It is believed that VET pathways are increasingly overshadowed by traditional university education, from which the largest and most sought-after employers in Denmark mainly recruit (Ibsen & Thelen, 2020). Our interviewees described that because these low rates make it difficult to align education and training with the demands of the labor market and industry, the government, employers, and unions have made it a priority to work together to make VET, especially in traditional craft occupations, more appealing to youth.

2.4 Adult Education & Retraining

As discussed above, Denmark has a strong focus on lifelong flexible learning and thus also has a dedicated adult learning system. The adult learning system operates under the same model of administration as initial VET under a parallel track and involves coordination with all the same governmental and social stakeholders. Although adults have full access to initial VET, there are equivalent qualification-rewarding programs designed for adults, whether employed or unemployed. The education reform started in the middle of the last decade established a new program, EUV (*Erhvervsuddannelse for voksne*), that has similar qualifications and is equivalent to the EUD in initial VET and is designed to add to an existing upper secondary qualification to form a pathway to higher education. Students without prior education can still enter the EUV program, however; EUV has three different levels of recognition for prior learning where each fulfills one or more requirements of the program. There is one level for no relevant work experience, another for less than two years of work experience, and a final level for at least two years of work experience (Andersen & Helms, 2019).

Another adult program is adult vocational continuing training (AMU), which is designed for specialization in specific sectors to help meet skills gaps and employer needs as well as to allow students to advance their training and competences at all levels of education in upper secondary and beyond (Andersen & Helms, 2019). AMU is offered by local area vocational
colleges, AMU training centers, and private providers, and it consists of short programs ranging from a half day to 50 days but averaging about a week. Though AMU is directed toward lowskilled and skilled workers, programs are available to anyone in Denmark regardless of education or employment; citizens can receive a fixed grant while attending AMU training that is similar to unemployment benefits (Andersen & Helms, 2019). Over 3,000 programs are available, and around 200 new programs are developed every year, with many others being updated or eliminated depending on the labor market (CEDEFOP, 2012). Programs may cover any or all of three broad learning areas: sector- or job-related technical competences, general competences and communication, and personal competences. Each program is individualized for students and can incorporate a mix of theory and practical education through school-based, workshop, and work-based learning. Additionally, in line with the flexibility of initial VET, there is a process in which prior and informal learning and experience is assessed and incorporated as credit or a certificate toward a full program, and that assessment serves as a foundation for an individual education plan (CEDEFOP, 2012). The AMU program exemplifies Denmark's belief in lifelong education by providing multiple pathways to achieve different qualifications throughout life. In our interviews, we learned that in the technical sector, for example, employers send or encourage their employees to enter these kinds of vocational programs to quickly train and reskill as needed.

Another adult VET program is the basic vocational adult education program (Grunduddannelse for voksne/GVU), which serves adults over 25 who have two years of work experience but lack formal educational qualifications. Designed to provide basic vocational training and retraining to older learners, this system parallels general education while also providing pathways to VET for supplementary qualifications. GVU is provided by an AMU center or VET college, is usually full time, and involves a combination of workplace training, participation in AMU courses, and recognition of prior learning for credit (CEDEFOP, 2012). Completion of a GVU program results in formal qualifications similar to those awarded by initial VET programs. Adults can benefit from entering GVU instead of initial VET because it is more individualized and because training plans are valid for six years, meaning enrollees can continue their employment if they have jobs while attending the program. Further adult education is offered at the tertiary level (Videregående voksenuddannelse/VVU) that is tailored to adult learning and offered part-time by business and technical schools (but must be completed within the six-year timeframe). These tertiary-level programs lead to qualifications that are similar to those in the general higher education path, such as the academy profession degree (Andersen & Helms, 2019; CEDEFOP, 2012).

3. Content

3.1 Curriculum Development, Standardization, and Skills

There are federal standards for nationally recognized qualifications, but there is also decentralized flexibility for pedagogical adaptations by VET providers to meet local needs. At the national level, the Ministry of Children and Education is responsible for both initial VET as well as adult continuing VET and reskilling, which both run parallel to mainstream general

education (EUC Syd, 2021; CEDEFOP, 2012). Also institutionally involved in VET are parliament, which creates educational frameworks, and about 50 national trade committees comprised of 10 to 14 members of employer and employee organizations who regulate and make binding federal guidelines for over 100 main VET courses in total (EUC Syd, 2021; CEDEFOP, 2012). An advisory council consisting of social partners, student organizations, teacher unions, and other relevant employee stakeholders also consults the ministry and national trade committees (EUC Syd, 2021; CEDEFOP, 2012). At the local level, school boards, institutional management, teachers, and even students all help implement VET curriculum at vocational colleges. However, individual school boards operate as the main administrative body for each self-governing vocational college, and each school has the financial and administrative responsibility to implement federal standards and adapt VET to local needs (CEDEFOP, 2012; Andersen & Helms, 2019). Localized training committees that are affiliated with each vocational college serve as advising bodies to help adapt federal curriculum to the needs of the local area, and they act as facilitators between colleges and employers for apprenticeships and training placements (EUC Syd, 2021; CEDEFOP, 2012). It is a taxing process, but a crucial one; our interviewees explained how standardized VET qualifications are strongly valued on the job market largely because of the close involvement of stakeholders in their design. In another example of the tight coordination between these partners, interviewees explained how firms—at their own expense—can ask schools to develop a specific type of course around a set of skills they need in future employees. Machinery in VET schools is not sponsored by employers, however. Schools must buy their own machinery using government funds.

Our interviewees also explained that VET curriculum is occasionally adapted based on national or local needs, though other experts disagree on how often this should or does happen. Still, this ability for trade committees to adapt programs offers flexibility, and such changes can and do occur over time at varying rates, depending on the industry or occupation. For example, technical programs are updated more than craft programs due to frequent changes within the industry. Interviewees suggested that although VET teachers are often on local trade committees and in direct contact with employers, they only have flexibility in the delivery of curriculum; they have little say in the actual content of the courses they teach.

Although soft skills are not explicitly taught or tested for in VET schools or apprenticeships, attempts have been made to integrate them into VET programs. Though schools continue to focus more on teaching hard skills based on a set curriculum, these "personal skills" are increasingly important and may be valued more by some employers than technical or hard skills.

3.2 Funding

The state finances VET at all levels, including adult education, through tax levies, as the government values and is dedicated to the education system and its coordination with the economy. Thus, basic, secondary, and upper level VET is publicly financed, along with informal learning and practical work experience with employers. Funding distribution for VET among

Danish colleges is largely determined by the number of full-time-or-equivalent students enrolled, though providers may receive additional state-funded grants for salaries and maintenance (CEDEFOP, 2012). Both public and private employers are required to pay into a reimbursement scheme whether they offer apprenticeships or not, while employers who do offer apprenticeships are allocated portions of these funds to help supplement the costs of apprenticeship training (Andersen & Helms, 2019).

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