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New Higher Education Model? Degree Apprenticeships as a Strategy to Modernize Apprenticeships: Rationale, Current Development in the U.S., and a Conceptual Framework

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Abstract

Purpose: To better prepare young people for the increasingly complex world of work in the global knowledge economy, apprenticeships are receiving renewed attention in countries without a strong history of vocational education. One of the strategies to promote and modernize apprenticeships in these countries is to offer apprenticeships integrated into degree programs, known as degree apprenticeships at the tertiary level. However, little research has been done to explore this new degree pathway. The purpose of this study is to explore the rationales and recent development of degree apprenticeships in the U.S. and to present a conceptual framework for designing and delivering such programs.

Approach: Through an extensive literature review, this study examines the underlying justifications for the integration of apprenticeships into degree programs. Subsequently, it delves into the current progress of degree apprenticeships in the U.S., substantiating the rationales. Finally, it explores multiple facets of degree apprenticeships, offering a conceptual framework for higher education institutions to consider when implementing such programs.

Findings: This study discusses two rationales for degree apprenticeships. First, they enable permeability of vocational education credentials, one of the features of a robust apprenticeship system. Second, they also equip higher education institutions to effectively

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prepare young people for work in response to globalization. For these reasons, recently, community colleges, the primary vocational education providers in the U.S., have actively been implementing apprenticeships within degree programs. This study also outlines four interconnected dimensions of apprenticeships - occupational, pedagogical, relational, and aligned – as a conceptual framework for implementing degree apprenticeships.

Conclusion: By providing a useful context and framework for degree apprenticeships, this study contributes to the growing body of research on apprenticeships and provides a foundation for on-going research to advance the theory and practice concerning degree apprenticeships. Future studies can explore the process of implementing degree apprenticeships using the suggested framework and develop strategies to further modernize apprenticeships based upon this study.

Keywords: Vocational Education and Training, VET, VET Modernization, Degree Apprenticeships, Community Colleges, Permeability, Globalization

1 Introduction

Driven by the forces of globalization and technology innovation, the 21st-century workplace has become much more complex (CEDEFOP, 2018). To better equip young people in transition from school to work, apprenticeships, after relative neglect in many countries, are receiving renewed interest as an effective way of preparing young people for work and serving the economy (Browning & Nickoli, 2017; Organisation for Economic Co-operation and Development [OECD], 2018). In the U.S., the Departments of Labor, Commerce and Education signed a Joint Declaration of Intent with the Swiss Federal Department of Economic Affairs, Education, and Research in 2015 to collaborate on the development of modern apprenticeships. The Intent supported exchange of information and practices regarding organizing education and training systems (State Secretariat for Education, Research and Innovation [SERI], n.d.) as well as collaboration with the business sector, facilitating the creation of apprenticeships in the U.S. by Swiss companies (U.S. Mission Switzerland, 2015 July). Due to these recent efforts, the number of new apprentices has grown by 64% in 2021 compared to 2012, and more than 14,700 new apprenticeship programs were created in the last five years. These new programs are increasingly designed for modern occupations (U.S. Department of Labor, 2021). While apprentices in the U.S. currently make up only about 0.2% of the labor force, which is 10 times less than the rates of about 2.5 – 3.0% in countries with strong apprenticeship, such as Switzerland and Germany (Lerman, 2019), the recent legislative support and growth of apprenticeships clearly demonstrate both public and private interest in further establishing apprenticeships.

While traditionally apprenticeships provided training for a narrow set of technical skills, often in manual or low-skilled occupations, countries with strong apprenticeship tradition have expanded apprenticeships to accommodate the needs of the modern economy, offering them in a broader range of occupational categories (Klor De Alva & Schneider, 2018). In these countries, such as Germany and Switzerland, a dual apprenticeship that combines learning in the workplace and in the school (Berhard & Graf, 2022) is an essential part of the overall education system, supporting youth employment and the strong economy (Hoffman, 2015). However, a robust dual system cannot be simply transferred from one context to another (Barabasch et al., 2009; Euler, 2013; Gonon, 2014; Stockmann, 2014). Apprenticeships involve various stakeholders, such as the state, employers, labor market institutions, and training organizations. To establish apprenticeships as a recognized vocational education pathway, all stakeholders' needs should be met in dynamic social, cultural, and economic contexts (Fuller & Unwin, 2012), which requires complex institutional arrangements. For these reasons, apprenticeship models vary in different contexts, and each country should identify an approach that is appealing to both employers and learners (Valiente & Scandurra, 2017) based on the understanding of a strong dual system.

One of the common strategies to promote and modernize apprenticeships in countries without a rich culture of vocational education is by creating them within modern occupations and integrating them into higher education by offering *degree* apprenticeships (DAs). For example, in the U.S., a growing number of community colleges have been integrating apprenticeships into their degree programs. These two-year institutions are a unique part of U.S. postsecondary education system, offering associate degrees and short-term vocational programs. As of 2022, there are 1,043 community colleges across the U.S., providing broad access to higher education (American Association of Community Colleges, 2022). Over the past three years, more than one hundred community colleges have joined the Expanding Community College Apprenticeships (ECCA) initiative to offer apprenticeships in both modern and traditional occupations, such as construction, advanced manufacturing, healthcare, information technology, finance and business, and energy (American Association of Community Colleges, 2021). Some 4-year universities also offer degree apprenticeships leading to a bachelor's or even a master's degree (Alabama A&M University, 2021 September). Besides the U.S., the U.K. government launched Degree and Higher Level Apprenticeships (D&HLAs) in 2014 to revive and modernize apprenticeships as a means of improving the country's skill. Since then, DAs have been growing quickly. 26% apprenticeship programs that started in 2019/20 in the U.K. were degree apprenticeships, an increase of 7% compared to 2018/19 (Hubble & Bolton, 2019). South Korea, a country extremely focused on academics with the highest rate of college enrollment in the world (McNeill, 2011), has also been strategically implementing various forms of DAs since 2014 to better prepare college students for the world of work (Ahn, 2019).

While more countries are adopting DAs, little research has been done to explore DAs as a strategy for modernizing and institutionalizing apprenticeships, especially in countries without a strong apprenticeship history. This study explores the rationales, current development in the U.S., and a conceptual framework for designing and delivering such programs. The aim is to raise awareness among scholars and policymakers about the recent movement to design strong career pathways through apprenticeships and lay down a foundation for future research. Based on a thorough narrative literature review (Gessler & Siemer, 2020), I first discuss rationales for DAs, followed by current development in the U.S. Then, a conceptual framework is presented for implementing DAs at higher education institutions. Finally, I conclude the study with recommendations for future research.

2 The Rationales: Why Degree Apprenticeships?

This section presents two rationales for why DAs can serve as an effective strategy to modernize apprenticeships. First, DAs enable the *permeability* of vocational education in the predominant education systems (Eichhorst et al., 2012; Renold & Caves, 2017). Second, DAs can equip higher education to effectively prepare young people for work in response to globalization and technology innovation. These two rationales are further elaborated below.

2.1 Enabling Permeability of Vocational Education

To establish an effective VET system, scholars (Renold & Caves, 2017; Renold, et al., 2018; Woessmann, 2008) suggest several crucial features need to be in place, such as a high level of linkage between education and employment sectors, good multilevel governance to coordinate among various stakeholders, and quality vocational programs that meet national standards. In addition, quality VET programs should be integrated into the overall education system to enable permeability, which means that VET credentials are transferable vertically across different levels of education, including tertiary education, and horizontally between the general education systems (Hamilton, 1994; Renold & Caves, 2017). In today's knowledge-based economy, higher education is regarded as a primary driver in advancing knowledge (Olssen & Peters, 2005). Therefore, permeability between VET and higher education is particularly crucial so that apprenticeships do not appear to be dead ends (Hamilton, 2020). Degree apprenticeships enable permeability in their design, strategically establishing apprenticeships without hindering the pursuit of higher education.

According to Bernhard (2019), the concept of institutional permeability is categorized into four dimensions: (1) Access, (2) recognition and validation, (3) organizational linkages, and (4) institutional support structures to meet the diverse needs of learners. Access to education is the first dimension that most people think of when considering permeability. Access

could be granted without limitation for a maximum level of permeability or based upon predetermined conditions. Recognition and validation of prior learning, as the second dimension, is under the premise that diverse educational paths can lead to similar competencies. The third dimension, organizational linkages, indicates connection between vocational and academic education at the organization level. It also implies that different types of education are integrated into one educational program or institution, as is the case with degree apprenticeships. The fourth dimension pertains to the provision of institutional support structures that facilitate successful learning experience in permeable educational pathways.

Overall, institutional permeability encompasses multiple dimensions, and various countries have implemented various measures to promote permeability in VET and higher education, including German-speaking countries with a strong apprenticeship culture. For example, when apprenticeships in Switzerland were increasingly perceived as a less ideal option since VET diplomas did not grant access to higher education, Universities of Applied Sciences (UAS) were established in 1990s. This created a path for VET diploma holders to pursue a professional baccalaureate (Meyer, 2009). In Germany, dual study programs emerged in the 1970s to combine university studies and work-based learning, and have become a prominent educational choice in the past fifteen years, blurring the boundaries between vocational and higher education (Ertl, 2020). In addition, some dual VET programs at the secondary level integrate the Abitur, a general higher education entrance qualification, offering double qualifications (Bernhard & Graf, 2022).

In the U.S., apprenticeships traditionally existed within a limited set of occupations, such as construction trades, primarily recruiting adult workers with very little linkage to secondary schools and colleges, which made apprenticeships invisible to policymakers (Lerman, 2013). For these reasons, the lack of permeability in U.S. apprenticeships has been pointed to as one of the culprits for the less than desirable status of such programs (Hamilton, 2020; Lerman, 2013). From this perspective, the current apprenticeship movement among community colleges has a higher chance of success due to its intentionality to include higher education institutions as apprenticeship providers (Hamilton, 2020). Recent federal grants, such as *Scaling Apprenticeship through Sector-Based Strategies* (U.S. Department of Labor, 2018) and *Apprenticeships: Closing the Skills Gap* (U.S. Department of Labor, 2019), also encourage higher education institutions to offer apprenticeships within their degree programs.

2.2 Degree Apprenticeships in Response to Globalization and Technology Innovation

Another rationale for DAs is that this nontraditional pathway can equip higher education institutions to effectively prepare young people for the globalized, knowledge economy. Globalization and the rapid development of technology have profoundly changed how we live,

causing increasing complexity in the world of work for young people to navigate (Jensen & Arnett, 2012; Larson, 2011; OECD, 2017). The global economy is now marked by the closely related trends of automation, digitalization, and robotification (CEDEFOP, 2018), which requires more skills and education to be successful in the workplace. To equip young people for the world of work, it is essential to provide right type of skills that enable them to successfully navigate an ever-evolving, technology-driven work environment (OECD, 2017).

While the role of education in response to globalization is a critical area of debate, in the global neoliberal era, employability is emphasized as one of the most important goals of education to equip individuals with economic productivity (Davies & Bansel, 2007; Hastings, 2019). For that, higher education is regarded as the primary player to advance the knowledge economy. As a result, the expansion of higher education has been in the interest of both developing and developed countries, and higher education has shifted from an elite to a mass system, especially in developed countries (Olssen & Peters, 2005), with an increasing emphasis on vocationalism and professionalism (Cheng et al., 2022; Department for Business, Innovation, and Skills, 2016; Sin & Neave, 2016).

For example, the Obama administration set the goal of leading the world in college completion by raising the U.S. college graduation rate among 25- to 34-year-olds to 60% by 2020 (Kelderman, 2020 January). Along with that, the administration pushed states to raise graduation standards in high schools by adopting Common Core academic standards, a curriculum initiative to increase the rigor of high school courses to prepare students for college and career. As a result, schools' performances are often judged by academic test results and whether or not students enroll in college (Lerman, 2013).

However, a mere expansion of higher education does not lead to career preparedness. According to recent surveys (Hart Research Associates, 2015; Society for Human Resource Management [SHRM], 2019), U.S. employers generally find it difficult to hire suitable candidates with the right soft and technical skills. Written and oral communication, teamwork, ethical decision-making, critical thinking, and the ability to apply knowledge in real-world settings are the most highly valued skills when hiring recent college graduates. While employers who participated in the survey rated the recent graduates' readiness with these skills as low, interestingly college students rated themselves notably higher in these areas, indicating a discrepancy between students' and employers' perspectives. Employers also highly valued applied learning experiences to improve job readiness and believed that it was important for higher education institutions to ensure such experiences through internships and community-based projects with people from diverse backgrounds. However, only 14% of the employers thought college graduates were equipped with such experiences (Hart Research Associates, 2015). Overall, employers felt that higher education has done little to help address the skills shortage (SHRM, 2019), which is disheartening considering the all-out efforts in the U.S. to expand higher education and the rising amount of student debt that has resulted.

DAs can effectively address the lack of job preparedness among recent college graduates. This learn-and-earn degree pathway enables student apprentices to acquire valuable real-world work experience and receive at least an apprentice's minimum income while pursuing the aspiration for college education (Mulkeen et al., 2019; Universities UK, 2016). DAs especially appeal to nontraditional students, such as job changers and those from underrepresented populations, allowing them to reach social mobility goals (Universities UK, 2017). For higher education institutions (HEIs), DAs facilitate collaborations with employers, strengthening existing relationships with them. Implementing DAs can also provide a new income stream for HEIs since such programs are often supported by national funding (Universities UK, 2016; Voeller, 2022).

Given these rationales discussed so far, countries without a strong apprenticeship history are strategically implementing various forms of DAs to better equip young people for the world of work. The following section highlights recent development of DAs in the U.S.

3 Past Challenges and Recent Development of Degree Apprenticeships in the U.S.

Apprenticeships were formally established in the U.S. with the passage of the National Apprenticeship Act in 1937 (Klor De Alva & Schneider, 2018). This act formulated a set of standards for registered apprenticeships regulated by the Department of Labor (U.S. Department of Labor, n.d.-a). However, this registered apprenticeship system, with little linkage to the formal education system, has never been fully established as a viable educational path (Lerman, 2013). Rather, apprenticeship programs have been dominated by construction trades and unions, held in low esteem as secondary options for low-performing high school students.

In the late 1980s and early 1990s, new initiatives were implemented to sponsor a variety of work-based learning programs at schools (Hamilton, 2020). These efforts developed amidst dissatisfaction with the nation's education system and a call for a radical change to improve school-to-work preparation to better compete with emerging economic powers, such as Germany and Japan. This movement culminated in the passage of the School-to-Work Opportunities Act (STWOA) by the Clinton administration in 1994. At that time, *youth* apprenticeships implemented at the secondary level received special attention as the most intensive form of work-based learning. However, unions generally opposed youth apprenticeships in fear of losing control over registered apprenticeship programs. Some were concerned about forcing youth to start careers too early (Lerman, 2013).

In addition, strong opposition was generated by apprenticeships presented as a non-college alternative for those who did not thrive at school (Hamilton, 2020). During the last several decades, there has been a strong emphasis on restoring U.S. leadership in college

completion, which has, in turn, raised the rigor of high school courses to prepare students for college (Lerman, 2013). Several scholars (Hamilton, 2020; Hoffman, 2011; Lerman, 2013) point to this "college-for-all" mentality in the U.S. as one of the key barriers that shifted attention away from the school-to-work transition. Youth apprenticeships were perceived as less prestigious compared to pursuing higher education, and the school-to-work movement faded.

However, recently, apprenticeships have re-emerged as an effective learning pathway, particularly for middle-skilled jobs in the U.S., receiving widespread bipartisan support (Browning & Nickoli, 2017; Klor De Alva & Schneider, 2018). Especially, community colleges are actively leading in the move to implement apprenticeships within degree programs (Browning & Nickoli, 2017). Community colleges, traditionally known as junior or technical colleges, are a unique and important part of the U.S. postsecondary education system. With their open admissions policies, these two-year institutions provide broad access to higher education and fulfill various missions. They prepare students for four-year universities, offer remedial/development education for underrepresented populations, and serve as the primary career and technical education (CTE) providers in the U.S. by providing short- and long-term, mainly school-based, vocational programs (Baime & Baum, 2016; Baker III, 1994).

Given their established role as the vocational education provider in the U.S., community colleges are natural partners in advancing apprenticeships (Browning & Nickoli, 2017; Hamilton, 2020). Consequently, there has been a surge in the number of community colleges implementing registered apprenticeships in both traditional and modern occupations (American Association of Community Colleges, n.d). One notable example is Apprenticeship Carolina, a division of the South Carolina Technical College System that offers statewide apprenticeship programs. Launched in 2007 by the state, Apprenticeship Carolina sought to expand apprenticeships as part of the state's workforce development efforts. To do so, it recognized the importance of including continued educational opportunities through apprenticeships, and for that reason, the SC Technical College System was recommended as the best central organization for promoting apprenticeships in the state. One of the main strategies for this initiative was to enhance the capacity of the state's 16 technical colleges to become providers for in-class instruction for registered apprenticeships (Stieritz, 2009). These efforts also resulted in the approval of an employer tax credit worth $1,000 per apprentice. Although not a decisive factor for employers, it has served as a helpful incentive for them to consider sponsoring apprenticeships (Lerman, 2013). Due to the state-wide efforts, apprenticeship opportunities increased significantly in South Carolina from 415 registered in 2006 to 2,946 in 2016 (Kuehn, 2017).

Apprenticeships at community colleges offer a pathway to earning a two-year associate degree, which can be transferred towards a bachelor's degrees. When an apprenticeship leads to a degree, the "conflict with the college-for-all ethos dissipates. College is not just a future

prospect for apprentices; they are enrolled now" (Hamilton, 2020, p. 119). The current development of DAs in the U.S. demonstrates that it is possible for countries without a strong recent history of apprenticeships to grow apprenticeships through strong government support, national funding, and development efforts, and DAs have been one of the key strategies to do so.

4 Design and Delivery of DAs: Work-Based Learning as a Conceptual Framework

So far, this study has examined the rationales for DAs and substantiated them by presenting their recent development in the U.S. While DAs offer unique opportunities for learners to learn and earn while pursuing a degree, implementing DAs can be challenging since this requires institutional changes and a high-level of coordination among various stakeholders, especially employers, to enable this nontraditional degree pathway. DAs require higher education institutions (HEIs) to be flexible with program design and delivery to accommodate the needs of companies and working students (Martin et al., 2020). This final section discusses various aspects of DAs to provide a conceptual framework for HEIs to consider when designing and delivering such programs.

The primary pedagogical premise of apprenticeships is based on a social model of learning. According to Lave and Wenger (1991), learning is a situated activity in which new members participate in communities of practice where old members pass down identities, knowledge, and skills. Apprenticeships situate young people in a community of practitioners which enables apprentices to learn through direct involvement in various work activities and guidance from their mentors. Later, Fuller and Unwin (1999) built on the original claim of the social model of learning and defined the following four interconnected dimensions as a broader context for apprenticeships: (1) Pedagogical (i.e., how learning is organized and delivered at the workplace and during in-class instruction), (2) occupational (i.e., how apprentices are initiated and plugged into a specific or broader occupational community), (3) locational (i.e., how employers' relationships with the community in which they are located enable apprentices to become part of the wider community), and (4) social (i.e., how the perceived success of the employer affects the community's perception of apprenticeships and how the local community regards apprenticeships as an important means for the school-to-work transition for young people).

While this framework situates apprentices in a broad sociocultural context, this study is more concerned with a conceptual framework that can be applied to the *design and delivery* of apprenticeships. For this, I synthesize Fuller and Unwin's (1999) framework with primary features of work-based learning (WBL) to present a conceptual framework for DA design and delivery. Broadly defined, WBL refers to learning and knowledge acquired in a work-

place (Basit et al., 2015). This definition includes work-like activities, such as field trips to workplaces, job shadowing, and service learning. This study, however, chooses a narrower definition – WBL "occurs in places where the principal activity is producing goods and services" (Hamilton, 2020, p. 61); requires direct and systematic input from employers and/or community (Darche et al., 2009); and involves a tripartite relationship between the education institution, the employer, and the learner (Basit et al., 2015). Based on this definition, apprenticeship is the most formal, intensive, and, indeed, ambitious form of work-based learning (Bailey et al., 2004; Hamilton, 2020). To ensure a quality learning experience, apprenticeships should include the following four interconnected features, distilled from the work of several scholars (Bailey et al., 2004; Darche et al., 2009; Fuller & Unwin, 1999; Hamilton, 1990) – occupational, pedagogical, relational, and aligned.

4.1 Occupational Dimension

The first dimension is *occupational*. Apprentices must engage in the workplace (Darche et al., 2009; RTI International, n.d.) and they should be given meaningful responsibilities and be initiated into a specific or broader occupational community of shared knowledge, skills, values, customs, and habits, often leading to certification(s) (Bailey et al., 2004; Fuller & Unwin, 1999; Hamilton, 1990).

Apprenticeships do not exist without employers who want to hire apprentices. However, company recruitment is a common and constant challenge in offering apprenticeships, especially in countries without a strong apprenticeship history. A typical hiring strategy for companies in these countries is to select a candidate already equipped with the necessary skills, or in the case of companies with more resources, conduct their own short-term on-the-job training. However, apprenticeships require a paradigm shift in which companies become directly involved in long-term training to develop a talent to meet their human resource needs (Choi & Hong, 2014).

To support engagement of employers in the U.S., various *intermediary* organizations have emerged. Nonprofits, private training companies, and industry organizations are among those facilitating connections between stakeholders to create and operate apprenticeship programs (Katz & Elliott, 2020). Community colleges frequently serve as intermediaries as well, by combining degree programs with apprenticeships. They convince employers to join apprenticeships, manage the relevant paperwork to make it easy for them to hire apprentices, match companies with apprentices, and deliver the classroom component of an apprenticeship (Bewick & Craig, n.d.; U.S. Department of Labor, n.d.-b; Voeller, 2022). Indeed, intermediaries are significant contributors to the growth of apprenticeships, especially in countries without a strong history of such programs to connect various stakeholders with different interests (Bewick & Craig, n.d.).

4.2 Pedagogical Dimension

The second dimension is *pedagogical*. Learning should be planned and delivered to impart vocational knowledge and skills (Fuller & Unwin, 1999). Common instructional strategies for WBL include learning by practice, feedback, discussions, modeling, hands-on projects, and direct teaching (Lucas et al., 2012). WBL also includes assessments that facilitate critical reflection and evaluate vocational proficiency. Critical reflection provides an opportunity for students to step back and connect what they are experiencing at the workplace with in-class instruction (Hamilton, 2020). It enables students to "justify and validate their claims for learning, by using a variety of evidence sources" (Brodie & Irving, 2007, p.15). Also, given the primary purpose of WBL as promoting the application of new knowledge and skills, assessment should demonstrate vocational proficiency. Examples of WBL assessment may include feedback from the employer, artifacts produced as part of learning, a reflective journal/essay, or a combination of these items. Assessment needs to be clearly linked to the learning outcomes and designed in an affordable, realistic way (Woolf & Yorke, 2010).

In DAs, learning occurs both at the workplace and during in-class instruction. However, while schools function around pre-designed learning objectives and course schedules, the primary purpose of a workplace is to produce goods or services. For this reason, thoughtfully designed workplace learning to train apprentices cannot be taken for granted from employers with demanding day-to-day work activities. In a case study of implementing degree apprenticeships at a community college (Voeller, 2022), the college exuded confidence in their ability to provide relevant technical instruction, but participant companies varied in their readiness to offer on-the-job training based on their resources and learning culture. To assist employers in delivering effective workplace learning, targeted training for apprentice supervisors, supported through public policy or employer organizations, can be helpful, especially when they first offer apprenticeships in partnership with universities (OECD, 2018).

4.3 Relational Dimension

Third, relationships between young people and adults should be fostered through mentoring. Hamilton and Hamilton (2002) argue that workplaces are "especially appropriate and powerful settings for mentoring" (p. 79). Mentors not only help apprentices apply their technical skills in the workplace, but also coach them in how to effectively communicate and work with others in a professional work environment (Hamilton, 1990; Hamilton & Hamilton, 1997; Helper et al., 2016). Additionally, mentors provide general career and education guidance, personal and professional growth, and a caring, emotional connection (RTI International, n.d.).

Guidance from mentors is achieved through demonstration, instruction, asking reflective questions, providing constructive feedback, and engaging with their apprentices in joint problem solving throughout the program (Hamilton et al, 2021). Apprentices are sometimes assigned to a single mentor for their entire apprenticeship while some might rotate through multiple departments, thereby working with multiple mentors. Over an extended period of time, the mentor and the apprentice often form a special bond coming from their mutual commitment (Hamilton & Hamilton, 2002), which may last well beyond the apprenticeship.

Despite the significance of workplace mentoring, it cannot be assumed that employers have the necessary skills to effectively mentor apprentices in partnership with higher education institutions (HEIs) (OECD, 2018), especially in countries without a strong tradition of apprenticeships. To address this, some more experienced HEIs have created short workshops and manuals to assist employers, particularly those who are new to apprenticeships. Additionally, some HEIs provide their own coaching/mentoring within the school to supplement any potential gaps in workplace learning. This is because apprentices are likely to have varying workplace mentoring experiences, depending on the readiness and resources of the employer (Rowe et al., 2017). Some community colleges are also taking steps to provide additional assistance, including workshops for employers and extra coaching for apprentices within the school to ensure successful mentoring experiences in DAs (Voeller, 2022).

4.4 Aligned Dimension

Lastly, but certainly not least, classroom teaching should be connected to workplace learning so that learning activities at these two locations complement and reinforce each other (Haimson & Bellotti, 2001; Hamilton & Hamilton, 1997). Achieving this alignment requires ongoing, substantial commitment from schools and employers, and for that, a joint management system between the schools and employers should be established (Darche et al., 2009).

School-work connectivity is a multidimensional, multilevel process (Aprea & Sappa, 2015). Literature suggests that alignment should be established in three stages: (1) The first stage is to identify in explicit terms what is supposed to be learned, such as the major duties, tasks, and task components of the occupation and align them with academic standards; (2) the next stage is to develop learning plans – the learning objectives, expectations, and time commitment for various activities – on which both the educational institution and the employer agree; (3) the last stage is to reinforce the alignment through joint management between the educational institution and the employer (Darche et al., 2009).

To achieve aligned learning experiences and facilitate joint management in DAs, it is crucial for the higher education institution and the company to determine what level of alignment to achieve, and establish ongoing communication channels and a set of practices

accordingly. This involves regular touchpoints, such as curriculum meetings, onsite visits, and annual reviews, as well as ongoing communications as needed (Voeller, 2022).

These four dimensions interconnect to create an optimal apprenticeship experience. For example, the alignment (*aligned*) of learning at school and at the workplace is achieved through well-designed VET curriculum (*pedagogical*) and ongoing mentoring (*relational*). Learning at school (*pedagogical*) is reinforced through real-world applications at work (*occupational*). Figure 1 depicts these four interconnected dimensions of apprenticeships.

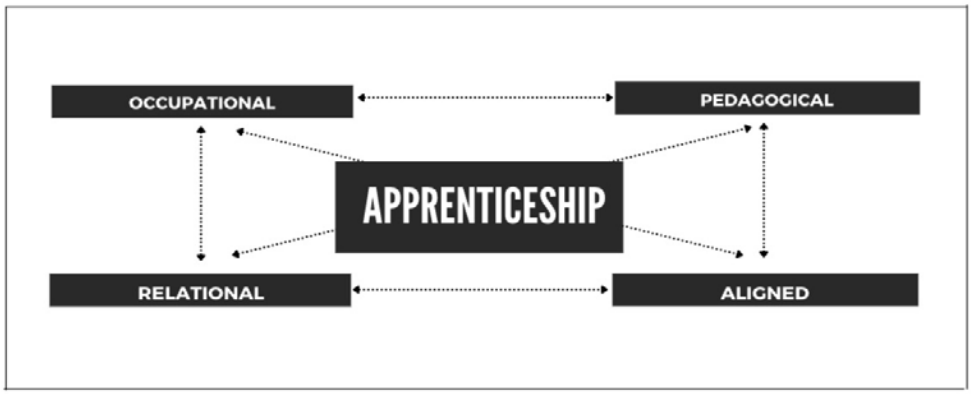

Figure 1: Four Dimensions of Apprenticeships

5 Conclusion, Limitation, and Recommendations for Future Research

There has been a growing interest in re-establishing and modernizing apprenticeships to better support young people in transition from school to work in the globalized knowledge economy. Implementing degree apprenticeships has been one of the strategies to do so, especially in countries without a rich culture of vocational education. This study explores this new degree pathway by discussing their rationales, substantiating them with recent development of DAs among community colleges in the U.S. A conceptual framework is also presented, distilled from the work of several scholars, that can be considered for designing and delivering degree apprenticeships.

By providing a helpful context and framework for understanding DAs, this study contributes to the growing body of research on apprenticeships, providing a foundation for future research that can advance the theory and support the practice for implementing DAs. However, due to the limited literature on this topic, this study lacks more in-depth discourse

about best practices and challenges of implementing DAs. A future study can build upon this study to explore implementation of DAs in depth. In addition, it can also focus on how to strengthen an ecosystem to support DAs at the policy level. For example, this study highlights permeability as one of the features of a strong VET system. Future research can focus on other features, such as how to enhance collaboration between education and employment sectors and how to establish multilevel governance to create an integrated environment for DAs. More research and attention from the scholastic community will further advance the current growing movement for adopting apprenticeships in the U.S. and beyond through DAs, ultimately better supporting the transition of young people from school to work.

Ethics Statement

This study does not involve any human participants and the author has no conflict of interest to declare.

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