The Struggle for Coherence in Emerging U.S. Career Pathways Initiatives

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Summary

In the last decade, the need to upgrade the skills and credentials for millions of low-skilled youth and adults has become an increasingly urgent focus of U.S. domestic policy. The challenges are widely understood—a balkanized, opaque credential landscape; curricula and supports unsuited for non-traditional students; and an insufficient grounding of learning approaches in work. And a wave of initiatives to reform policies and systems and develop and foster improved education and training strategies has put many promising answers on our national drawing board.

As this impressive collective response to extensive fragmentation moves forward, achieving coherence across initiatives has itself become a challenge. Absent the capacity to mandate a comprehensive overhaul of national workforce systems, attention increasingly is focusing on providing strong channels through which diverse initiatives can flow naturally. Policymakers and practitioners increasingly recognize the need for common integrative principles to create such channels, and a set of such principles—the "career pathways framework" – has emerged as the leading contender for such a function. Beginning as a loose, organic movement, career pathways increasingly is being built into major policies, systems, and practices at the national, state, and local levels.

A core career pathways principle is that post-secondary education and training systems should be based on portable, stackable sub-baccalaureate credentials linked to mid-skill jobs and laddering to more advanced credentials and job opportunities. Steps are structured to maximize access at different skill levels and to facilitate exits to employment and subsequent returns to school. Education and training is closely linked with work, by involving employers in program design and instruction and by infusing studies with work experience. Systems address special challenges facing low-income youth and adults by adopting more engaging approaches to instruction; teaching attitudes and skills for success at school and work; offering more ample guidance and peer supports; and providing sufficient financial aid and other supports.

The body of this paper assesses the challenges in aligning promising strategies in two important areas of practice with career pathways principles—strengthening post-secondary credential systems and promoting work-based learning. It considers the promise, as well as the limitations, of responses to date in these areas and identifies knowledge needed to develop and scale promising approaches.

The last part of the paper argues that attention to more rigorous development of career pathways as an organizing framework could help in accelerating the pace and quality of efforts to achieve systemic change. The potential has been magnified greatly by a series of recent initiatives, including a central emphasis on career pathways in the recent reauthorization of WIA as the Workforce Innovation and Opportunities Act and in the last round of Trade Adjustment Assistance Community College and Career Training grants, as well as in many other federal and foundation system change projects. The paper concludes by recommending two modest additional steps the federal government could take to consolidate across emerging initiatives: first, to strengthen informal cross-agency coordination on job training through the establishment of a national platform for

coordinating career pathways initiatives, and, second, to provide a more conceptually rigorous statement of the career pathways framework and associated theories and evidence through a major National Research Council review.

The Struggle for Coherence in Emerging U.S. Career Pathways Initiatives

In the last decade, the need to upgrade the skills and credentials of millions of low-skilled youth and adults has become an increasingly urgent focus of U.S. domestic policy. The challenge is not a shortage of promising ideas, but rather of the capacity to establish feasible and effective approaches and implement them at scale in comprehensive programs and system change initiatives. In this paper I survey emerging strategies in two important domains of practice—strengthening post-secondary credential systems and promoting work-based learning. I then review proliferating efforts to forge coherent systems based on improved strategies. There has been increasing alignment in the U.S. on a set of principles for integrating comprehensive changes in policies, systems, and programs. This framework—commonly known as "career pathways"— has moved to front stage in U.S. workforce development efforts.[2]

The core principle is that post-secondary education and training systems should be based on portable, stackable sub-baccalaureate credentials linked to mid-skill jobs and laddering to more advanced credentials and job opportunities. Steps are structured to maximize access at different skill levels and to facilitate exits to employment and subsequent returns to school. Education and training is closely linked with work, by involving employers in program design and instruction and by infusing studies with work experience. Systems address special challenges facing low-income youth and adults by adopting more engaging approaches to instruction; teaching attitudes and skills for success at school and work; offering more ample guidance and peer supports; and providing sufficient financial aid and other supports.

Alignment on strong integrative principles may hold the key in countries such as the U.S. where there is relatively weak national authority to promote uniform, coherent, and sufficiently resourced career pathways systems. The U.S. currently appears headed in this direction, with a growing configuration of stakeholders at work establishing technical and substantive aspects of a framework and adopting various strategies for incentivizing, assisting, and evaluating results. To date, this has been an informal, organic development in which an impressive array of major foundations, key federal agencies, states and community college, workforce, and human service systems have provided strong leadership.

At the federal level, more formal adoption and concerted development of career pathways as the primary organizing framework could help greatly in accelerating the pace and quality of efforts to achieve systemic change. Positioned between broad national goals (e.g., one year of post-secondary education, two million more skilled workers, improved coordination of training programs) and specific coordination foci (e.g., develop college-business partnerships, improve longitudinal data bases, establish a what works clearinghouse for employment and training), a sturdy framework would identify the basic ideas in exemplary systems and programs and the theories of change connecting interventions to desired outcomes. Two relatively low-cost steps the federal

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[2] See Austen et al. (2012), Clagett & Uhalde (2011), Jenkins (2006), Fein (2012), and Symonds et al. (2011).

government could take to improve planning and coordination would be to: (1) strengthen current informal cross-agency coordination of career pathways initiatives by establishing a high-level platform for this work and (2) commission a National Research Council review leading to a first cut at a conceptual framework for career pathways.

Strengthening U.S. Credential Systems

The universe of occupational credentials in the U.S. is vast, diverse, fragmented, and poorly mapped. Individuals trying to plan their careers face a dizzying array of possibilities with little by way of overall guidance and structure.[3] Educational institutions; federal, state, and local governments; trade associations; and private firms all offer a vast array of credentials.[4] No authority is responsible for coordination overall, or for many broad types of credentials. Addressing this problem is one of the core thrusts of emerging career pathways initiatives.

Many advocates believe that sub-baccalaureate certificates offer the best routes to career pathways for disadvantaged youth and adults. Post-secondary institutions (mainly two-year colleges) issued nearly one million sub-baccalaureate certificates in 2009-10—a 64 percent increase in ten years.[5] Certificates are granted in diverse fields and vary considerably across states and colleges within states. The connections between certificates and other certifications and degrees and jobs are variable and difficult to discern. Non-credit coursework may not appear on official transcripts or connect to regular credit programs. Regular credits may or may not be transferable to other programs at the same or different schools.[6] As summarized by Carnevale et al.:

> Post-secondary certificates are a homegrown, American invention. They are America's version of the apprenticeship or occupational track. What is unique about postsecondary certificates is their diversity and flexibility. There is no common brand (2012b, p. 26).

Educational certificates are only one of many kinds of sub-baccalaureate credentials. Others include registered and unregistered apprenticeship certificates, occupational licenses (typically awarded by state government agencies), certifications issued by professional associations, industries or companies; and certificates issued for completion of specific meetings or courses. Each of these types has grown independent of the others with little uniformity across areas or industries and uneven information on occupational demand.[7]

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[3] On problems and solutions related to complexity, see Rosenbaum et al. (2006), Scott-Clayton (2011), and Sugar (2010).

[4] See Carnevale et al. (2012b), Kuczera & Field (2013), and U.S. Department of Education (2012) for overviews.

[5] U.S. Department of Education (2013).

[6] Van Noy et al. (2008), Scott-Clayton (2011), and U.S. Department of Education (2012).

[7] See U.S. Department of Labor (2010) for a good overview.

This diverse, fragmented credential landscape reflects the highly decentralized nature of American education and workforce development systems. The federal government has little effective authority over post-secondary education and training. Rather, thousands of private systems at individual institutions operate fairly independently—adjusting programs to local demand and funding shifts, in response to information from employer advisory boards, state or regional economic planning boards and labor offices, or enrollment trends.[8]

Initiatives to Strengthen Credential Systems

While many nations in the Organization for Economic Cooperation and Development (OECD) are moving towards uniform national systems for credentials (referred to as "qualification frameworks"), efforts to strengthen credential systems in the U.S. are disparate and loosely coordinated. Approaches vary with agency missions, levels of government, and organization type. Some focus largely on mapping existing credentials to jobs and other credentials, whereas others can involve substantial curriculum development and restructuring. In many instances, work on credential frameworks is just one aspect of efforts to integrate wider systems—employment, social services, economic development, and various educational institutions—to build career pathways.

A few basic principles nonetheless have gained broad acceptance in emerging initiatives to strengthen U.S. credential systems. As described in a recent U.S. Department of Labor (DOL) guidance document, "career-enhancing credentials" should be widely recognized by employers in relevant industries and occupations. They should be stackable, that is "part of a sequence of credentials that can be accumulated over time to build up an individual's qualifications and help them move along a career pathway… to different and potentially higher-paying jobs." And they should be portable— recognized and accepted in different geographic areas, at other educational institutions, and by multiple employers and industries.[9] There is also increasing agreement that systems should be organized to promote completion of at least one year of post-secondary education and training.[10]

Lacking authority to create a national system based on these principles, federal agencies are using a variety of tools, technical assistance, and program funding instruments to encourage development of stronger frameworks at the industry, state, and local levels.

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[8] A recent ED overview described the organization of secondary and, especially, post-secondary education in the U.S. as "powerfully centrifugal—with separate state governing bodies, state legislative committees, national legislative subcommittees, professional associations, statutes, funding streams, career systems, and specialized media (U.S. Department of Education 2012, p. 64)."

[9] U.S. Department of Labor (2010).

[10] The one-year goal has been a key plank in the Obama administration's college completion initiatives (http://www.whitehouse.gov/the-press-office/remarks-president-american-graduation-initiative-warren-mi, http://www.whitehouse.gov/sites/default/files/cantwait/final_-_education_blueprint_-_an_economy_built_to_last.pdf) and traces originally to evidence that a full year of community college constituted a "tipping point" in earnings and subsequent college attainment (e.g., Prince & Jenkins 2005). Interestingly, the average secondary school graduate in other countries with strong VET systems has occupational skills at approximately this level (Hoffman 2011).

For example, DOL has developed tools to help the general public and workforce professionals map skills and interests to occupations, assess opportunities in those occupations (e.g., salaries, projected openings), and identify requirements for training and providers of credentials needed to qualify for positions of interest.[11] It also has developed tools to help industries and workforce professionals build industry-specific competency models and map career ladder/lattices for specified occupations.[12]

DOL is re-fashioning the major workforce programs it administers to support state and local efforts to strengthen credential systems. In a 2010 guidance document, it enjoined staff throughout the workforce system to use WIA Title I and other grant programs to take a series of steps to increase credential attainment.[13] Such efforts are likely to intensify as a result of the substantial emphasis on career pathways and related training in WIA's reauthorization as the Work Innovation and Opportunity Act.[14] In addition to WIA, DOL administers a portfolio of competitive grant programs providing resources to workforce agencies, community colleges, and community-based organizations for career pathways programs.[15] One of the larger of these programs, the $2 billion Trade Adjustment Assistance Community College and Career Training (TAACCCT) grant program, has assembled its own extensive online resources intended to share knowledge and tools and increase access to technical assistance.[16] The most recent, and final, announcement of nearly $500 billion in competitive grants included a strong core emphasis on curriculum and credential alignment as well as additional incentives to strengthen state systems and create nationally-recognized frameworks of competencies and credentials.[17]

The U.S. Department of Education (ED) has a number of initiatives to strengthen credential systems. The 2006 reauthorization of the Perkins Act, the major source of funding for Career and Technical Education (CTE) in the U.S., articulated general guidelines for "programs of study" embodying career pathways, and the agency subsequently identified 10 components that state and local programs should meet.[18] While identifying widely-shared goals of strengthening and linking two-year secondary CTE programs to two year sub-baccalaureate programs and the latter to four-year baccalaureate programs, a recent ED report observed that the primary policy tool available—Perkins—was ill-suited to the task. It provides only a small slice of funding for post-secondary vocational education and training and is distributed by a formula that

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[11] These tools leverage information in the Occupational Information Network (O*NET) – an extensive database of skills and competencies for specific occupational titles powered by data from employee and employer surveys; and labor market surveys and projections prepared by the Bureau of Labor Statistics.

[12] See toolkits and other resources at https://www.workforce3one.org/.

[13] U.S. Department of Labor (2010). .

[14] Obtain copy of H.R. 803 at http://www.help.senate.gov/imo/media/doc/WIOA%20Bill%20Text.pdf.

[15] Major DOL career pathway programs include the Trade Adjustment Assistance Community College and Career Training Grant Program, Workforce Innovation Fund, and 2009 American Reinvestment and Recovery Act grants for programs providing training in emerging and high growth industries.

[16] http://www.taconnect.org/.

[17] See the Solicitation for Grant Applications at http://www.doleta.gov/grants/pdf/SGA-DFA-PY-13-10.pdf.

[18] Stepanovic et al. (2012), U.S. Department of Education (2012).

provides little basis for shaping institutional behavior.[19] The administration has proposed legislation strengthening incentives to develop strong and innovative CTE programs.[20] Also, the National Association of State Directors of CTE Consortium has developed and is encouraging adoption of broad standards for competencies taught by CTE programs in different occupations. This initiative created common career technical core standards for 79 career pathways in 16 broad career clusters and is working with states and local programs to encourage them to embody these standards in CTE programs.[21]

ED also administers the nation's adult basic education system (under WIA Title II). Low rates of transition from ABE programs to post-secondary education have focused substantial attention on how to strengthen the quality of adult literacy instruction and connect literacy programs to career pathways.   A recent project, Policy to Performance, provided technical assistance and worked with eight states to strengthen connections between ABE programs and occupational programs at community colleges.[22] Also to strengthen such connections, other ED projects also have developed and are promoting adoption of uniform college and career readiness standards for adult education.[23]

Although Labor and Education are the principle federal agencies involved in strengthening U.S. credential systems, other agencies also are engaged in significant career pathways work. The Department of Health and Human Services (HHS) is administering and rigorously evaluating 30 local grants to provide low-income adults training in health care occupations following career pathways principles and it is conducting a separate random assignment evaluation of nine career pathways programs.[24] The Social Innovation Fund, administered by the Corporation for National and Community Service is also scaling up and evaluating a number of career pathways programs.[25]

Private foundations have launched a myriad of initiatives to strengthen credential systems. Typically operating with less funding than federal programs, these projects aim to catalyze changes in policies and systems through strategic planning, technical assistance, and demonstration programs. Most operate through small grants to purposefully-targeted (and often overlapping) subsets of states, community colleges, and community-based organizations. Each initiative has a somewhat different niche, though as names of illustrative project indicate, their missions overlap heavily: ABE-to-College (Nellie Mae), Accelerating Opportunity (Gates), Achieving the Dream (Lumina), Breaking Through (Mott), Completion by Design (Gates), Shifting Gears (Joyce). Related projects also are being run by non-profit organizations such as the Center for Law and Social Policy, Complete College America, Jobs for the Future, and Opportunity

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[19] U.S. Department of Education (2012).
[20] See http://www2.ed.gov/about/offices/list/ovae/pi/cte/transforming-career-technical-education.pdf.
[21] http://www.careertech.org/career-technical-education/cctc/.
[22] Alamprese (2012).
[23] These standards result from work by expert panels in adapting for adults the Common Core State Standards in English Language Arts and Mathematics developed for grades K-12. See http://lincs.ed.gov/publications/pdf/CCRStandardsAdultEd.pdf.
[24] http://www.acf.hhs.gov/programs/ofa/programs/hpog.
[25] http://www.cns.gov/programs/social-innovation-fund.

Nation. These projects typically focus on building peer networks, creating and disseminating tools and web-based resources for developing career pathways systems, and research and advocacy. Major professional associations such as the Association of Community Colleges, National Conference of State Legislatures, and National Governors Association also have sponsored initiatives, conferences, and papers on related issues.

The proliferation of career pathways initiatives may partially be working against the very coherence they are trying to promote. Multiple grant programs requiring partnerships and systems coordination can be difficult for providers to achieve. Some states, community colleges, and community organizations opt to participate in multiple initiatives, while others participate in none. Federal databases track some types of credentials, and associated occupational opportunities and programs of study—but this tracking is not comprehensive or well systematized. A dense amount of related materials and online toolkits may be complicating the task of finding good help. Coordination across initiatives occurs sporadically, but without any overall map or plan. Sections at the end of this paper elaborate on related challenges and possible efforts to promote greater coherence across initiatives.

Illustrative Approaches to Strengthening Credential Systems

Although there is little formal coordination across U.S. initiatives, there nonetheless are many indications of promising ferment. Not surprisingly, given the patchwork of initiatives and targeted systems, the results take many forms. The following examples illustrate this variety:

Industry-wide qualification systems. The National Association of Manufacturers (NAM) has developed a Manufacturing Skills Certification System to provide a standardized credential framework for the manufacturing sector. Funded primarily by industry, NAM used online tools and other resources developed by DOL in developing its system.[26] The system identifies basic work readiness skills and certificates for entry level employment, general manufacturing competencies and credentials, and qualifications and credentials for specific occupations (e.g., production line, welding, machining and computer numerical control). NAM is working with community colleges in four pilot states to align curricula with its certification system and will be promoting wider national adoption.

Systems for assessing and certifying work readiness. Several private firms have developed work readiness assessment systems for use by employers in hiring and training.[27] These systems are financed primary through usage fees. Their main elements involve assessment and certification of basic skills needed for employment. These skills cover areas like information-seeking, critical thinking, flexible problem-solving,

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[26] See U.S. Department of Labor (2010) and http://www.themanufacturinginstitute.org/Skills-Certification/Skills-Certification.aspx.

[27] Leading examples include the Workforce Skills Certification System of the Comprehensive Adult Student Assessment Systems (CASAS), the National Work Readiness Credential of the National Work Readiness Council, and ACT's National Career Readiness Certificate. See Austin et al. (2012) and Parker & Spangenberg (2012) for discussions.

creativity, communication, teamwork, dependability, leadership, in addition to literacy and numeracy. One example, ACT Inc.'s National Career Readiness Certificate (NCRC) focuses on skills in applied math, locating information, and reading for information, with an optional additional assessment for psycho-social skills.[28] ACT markets the NCRC to workforce development agencies and employers as a tool for job readiness preparation and for hiring and training employees. It also has been included as a stackable credential in broader certification systems such as the Manufacturing Institute's Manufacturing Skills Certification System (see below). Little evidence is available on the degree to which employees recognize and value varying work readiness credentials—that is, on the degree of their portability. As the number and variety of such assessment systems grow, it may become more difficult to foster broad acceptance of particular credentials.

Strengthening state credential systems. Oregon's Career Pathways Initiative is a leading example of a state-level effort to strengthen educational certificate systems at community colleges.[29] With funds, tools, templates, and assistance provided by the state, community colleges have developed over 180 career pathways programs. The core credential in these programs is a Career Pathways Certificate based on 12-44 credits of coursework and designed to provide entry-level employment in occupations in local demand. Programs are structured so that these certificates are stackable, providing "momentum points" towards higher-level education and credentials.[30] Using online tools, colleges create visual roadmaps to help students and workers choose career paths and identify credentials needed to advance in them. Oregon engaged a wide range of important stakeholders in developing this system, including: a consolidated Department of Community Colleges and Workforce Development, the state's 17 community colleges, the Oregon University System, the high school CTE Network, Workforce Investment Boards, and major employers and industry groups. The state has skillfully secured and blended funding from multiple federal (e.g., WIA Titles I and II, Perkins, Pell) and state sources to finance this initiative.

Community-based career pathways programs. Many community-based organizations have developed stand-alone career pathways programs that provide customized training for "bridge" programs and connect to regular programs and credentials at community colleges. These programs typically also provide intensive counseling and other supports. One of the more fully-developed examples is *Carreras En Salud*, a Chicago-based program run by Instituto del Progreso Latino.[31] The program's bridge courses provide contextualized basic skills training and connect to subsequent community college courses and preparation for certifications in Certified Nursing Assistant, Patient Care Technician (e.g., electrocardiogram, phlebotomy), Licensed Practical Nurse, and Registered Nurse. The program targets low-income adults with limited English proficiency and language and math instruction as low as the 6th grade level. Higher level bridge programs articulate with prerequisite and LPN/RN coursework at Wilbur Wright Community College. The program is designed to facilitate exits to employment and encourage subsequent re-entries at higher rungs of its health care career ladder. Participants receive

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[28] https://www.act.org/products/workforce-act-national-career-readiness-certificate/.
[29] See http://www.worksourceoregon.org/.
[30] http://www.worksourceoregon.org/index.php/career-pathways/156-career-pathways-roadmaps
[31] See Estrada (2010).

intensive guidance, child care, help accessing public benefits, assistance with school fees, and other support services. The program development and growth owes to Instituto's participation in foundation projects and ability to secure and blend multiple sources of federal, state, and foundation funding.

Evidence on Emerging Credential Systems

Researchers can play an important role in tying diverse initiatives together by helping to develop and tighten conceptual frameworks, devise strong measures and analytic methods, and design individual research and evaluation studies to build a systematic knowledge base. A good deal of pertinent work is underway, but there is little coordination across studies. Three broad categories of questions provide the basis for a more coherent agenda: To what degree are well-designed credential systems being implemented and what are their basic features? How successfully are various target populations engaged and advancing in programs leading to marketable credentials and career track employment? And to what degree have interventions contributed to successful outcomes?

Assessing implementation. There is no ready data source for assessing progress in creating seamless career pathways in the U.S. The fragmented and decentralized nature of credential systems and initiatives to strengthen them make this a difficult problem to solve.

What occupations are covered, and what credentials are available? How well are they aligned and stacked to create career ladders, and to be portable across educational institutions and employers? Do emerging systems provide opportunities for populations at different skill levels and with varying barriers? To what degree have credentials been optimized to fit to requirements for current and projected job openings? To be widely understood and recognized by employers?

Answering these questions requires data on system elements such as the number and kinds of credentials available and descriptions of training underlying and connections across credentials and with jobs. It also requires efficient ways to summarize at specified levels of geography or at the institutional level (e.g., for a college or college system). Various state and federal databases gather information on programs and credentials, but the quality and consistency of information are highly uneven.[32]

One project that has taken initial steps to chart this terrain is a ten-state initiative to develop benchmarks for quality career pathways programs. It has published a list of illustrative career pathways system properties to measure.[33] These attributes include expected duration, target population, occupation/industry focus, credentials available and associated credits, staffing, coordination mechanisms, number of programs, and funding

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[32] For a list of websites compiling state-level documentation on career and technical education systems, see U.S. Department of Education (2012, p. 13). A useful guide to directories and databases for a wide variety of credentials is provided in U.S. DOL (2010, pp. 11ff)

[33] Center for Law and Social Policy (2013).

sources and levels. As the project's main focus will be measuring outcomes, it is unclear that it will provide rigorous descriptive measures for system properties.

Measuring and monitoring outcomes.   Assessing the quality of credential systems requires measuring and evaluating their output. In addition to the gross output of credentials of different types at different levels—e.g., for different levels of government, institutions, and programs—assessing credential systems requires tracking how individuals progress through career pathways.[34]
The federal Department of Education collects generally good aggregate data on regular (for-credit) certificates and diplomas from colleges and universities useful in monitoring broad trends in its Integrated Post-Secondary Education Data System (IPEDS).[35] But counts for other types of credentials are scattered and often incomplete. For example, reporting to IPEDS is very incomplete for non-credit programs, DOL keeps records on registered but not unregistered apprenticeships, many different state and local agencies keep records on occupational licenses, and there is no centralized data for the vast array of professional certificates offered by firms and non-profit organizations.[36]

Efforts to strengthen credential systems raise questions about how individuals progress through successive educational programs and certificates and entries and exits from jobs in fields related or unrelated to training. Answering these questions requires analysis of longitudinal data on successive school and work experiences for individuals. The federal government does not collect data of this kind but has provided grants and technical assistance to support the development of state longitudinal databases based on students' college records and earnings in state unemployment insurance wage record systems. A recent survey found considerable variability in coverage, contents, and accessibility for research across states.[37]

The U.S. also fields national surveys incorporating measures of education and training—some longitudinal and others cross-sectional.[38] Until recently, these surveys did not provide very good coverage of many kinds of (especially non-college) post-secondary credentials, and it was not clear that respondents could report specific types of credentials accurately. A federal interagency group recently summarized:

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[34] The need for improved measures of credential outcomes arises in a variety of contexts. For example, increasing degree and certificate attainment is a key Department of Labor performance goal and credential counts are required reporting element in WIA and other key programs. Increasing concern about productivity in U.S. higher education inspired a recent in-depth National Academy of Sciences investigation of measurement issues. Researchers evaluating programs designed to boost credential output face a number of basic measurement and analysis issues that arise in performance measurement.

[35] See Sykes (2012). The main coverage gap in IPEDS is in sub-baccalaureate certificates granted by the approximately half of for-profit providers who do not participate in Title IV federal financial aid programs (Cellini & Goldin 2012).

[36] See U.S. Department of Labor (2010) for information on various credential databases, and Sykes (2012) and Reimherr et al. (2013) on needed improvements in IPEDS and college outcome monitoring systems.

[37] See http://www.sheeo.org/sites/default/files/publications/StrongFoundations_Full.pdf, and other resources at http://www.sheeo.org/projects/state-postsecondary-data-systems-0.

[38] For example, the longitudinal Beginning Post-Secondary Students survey collects college certificate and degree as well as extensive additional information for large cohorts of first-time college students. See: http://nces.ed.gov/surveys/bps/.

[T]here is no federal data collection that measures the prevalence of industry-recognized certifications, state and local government issued licenses, subbaccalaureate educational certificates, noncredit instruction and other nondegree credentials among the U.S. adult population… Without the ability to count certifications, licenses, and certificates, it is difficult to evaluate public policies designed to help Americans access and benefit from these credentials.[39]

This working group recently conducted a pilot survey with improved measures of enrollment and attainment—analyzing results in relation to more specialized surveys and against known credentials for a seeded subsample from administrative data. Findings were encouraging, and the group is pursuing efforts to promote wider use of its measures and develop a new household study of education, training, and credentials for work.[40]

In addition to data collection challenges, thorny definitional issues arise in measuring educational progress. The great diversity in credential types, durations, and fields makes it difficult to define summary measures supporting valid comparisons between population groups, across institutions, and over time.

For example, within a given time period, more individuals are likely to complete short- than longer-term credentials, though many still could be engaged in longer programs—how to weight the two to compare success across groups or programs pursuing different types of credentials is problematic. A National Research Council working group recently endorsed the concept of indices combining measures of both time (e.g., credit hours) and credentials, but concluded that implementing such indices was not yet possible.[41]

The difficulties include complexities of establishing standards for translating hours and credits into common terms and related data and analysis issues. Expected earnings may seem an obvious standard for translating hours and credentials into a common currency, but severe technical challenges and conceptual concerns arise. Technically, the data necessary to estimate returns for fine-grained credentials are generally not available, and statistical identification of causal effects is problematic. Conceptually, policy and program goals often are broader than raising earnings. For example, the Carreras program described earlier seeks to address a shortage of Spanish-speaking health care professionals, who may have lower average earnings than other occupations for the same population. Should the goal always be to maximize earnings? Other, non-economic, goals such as fostering knowledge, citizenship and personal fulfillment are fundamental goals in post-secondary education.[42]

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[39] Bielick et al. (2013, p. iii).
[40] Bielick et al. (2013).
[41] National Research Council (2012a).
[42] See Grubb & Lazerson (2004). Indicative of the tensions between employment and educational goals and orientations is the U.S. Department of Education's letter responding to a draft GAO report on needed coordination of employment and training programs. ED argued that the career and technical education programs it administered under the Carl Perkins Act were *educational*, rather than employment and training, programs and thus should not be included in the report (U.S. General Accounting Office 2011, Appendix XII).

In a number of European countries with strong national VET systems (and educational outcomes), aspects such as fulfillment and citizenship are deeply engrained in the concept of a "qualification."[43] These aspects are included in the common scale for skill and proficiency that the EU has devised for member counties' use in mapping varied occupations into a common Employment Qualifications Framework. Whether the underlying definitions could lead to strong quantitative measures seems worth exploring.

Another widely recognized challenge in performance measurement is devising measures for credential output that standardize for differences in participant characteristics and other contextual factors (e.g., local economy, resource availability). The goal is not so much to measure performance accurately, but rather to *signal* desired results and avoid creaming and other perverse incentives.[44]

Measuring impacts. The goal in impact evaluation is to measure whether policies and programs *actually cause* desired outcomes. Measuring impacts requires an accurate way of measuring how, on average, outcomes for people experiencing an intervention compare to the outcomes that would have occurred absent the intervention. The only reliable method is a randomized clinical trial. Though increasingly understood and conducted in the U.S., experiments in many situations are difficult, if not impossible, to devise.

Revamped credential frameworks raise special challenges for impact evaluation.[45] Although sometimes built into discrete programs, changes often are implemented in wider institutional systems. Interventions may stress guidance and mapping of existing credentials or creation of new program and credential steps on career ladders. Changes in support services and employment activities often accompany changes in credential frameworks.

To date, experiments have been used to evaluate only a few career pathways-type programs. These interventions have focused on promoting initial steps onto career ladders. One category includes tests of short-term (typically semester-long) "bridge" programs at community colleges based on learning communities and contextualized basic skills, with strengthened career development and guidance provisions. For the most part, findings showed small improvements in basic skills and credits earned (mostly in the bridge programs), but little effect on persistence or credential attainment.[46] Another category includes studies of training for entry-level jobs in high-demand occupations provided by community organizations and targeting high school graduates. Several recent studies have found positive earnings impacts.[47] Although incorporating some

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[43] See Hoffman (2011).

[44] See Besharov & Cottingham (2011) for papers on performance measurement in WIA and Dougherty & Reddy (2011) for a literature review on community colleges performance monitoring.

[45] See Fein (2012) for discussion of issues in designing random assignment evaluations of career pathways programs.

[46] Findings for the New Visions program in Fein & Beecroft (2006) and for the Learning Communities Demonstration sites in Visher et al. (2012) were generally disappointing. Tests of two bridge programs at Kingsboro Community College (Sommo et al. 2012) and LaGuardia Community College (Martin & Broadus 2013) showed more positive results.

[47] Most notably Maguire et al. (2010) and Roder & Elliot (2011).

career pathways ideas – such as manageable training steps for jobs in local demand, and intensive career guidance and other supports – there is little evidence on more extensive career pathways interventions based on inter-connected sequences of credentials.

A number of ongoing experiments are testing interventions embodying fuller career pathways. For example, the ISIS evaluation is testing the Carreras En Salud program described above and eight other career pathways programs.[48] Measures of credential attainment will be central in this study.   However, it will not be possible in these tests to isolate the contribution of strengthened credential and qualification mapping to results, since such components are bundled with other specific approaches to curriculum and instruction, academic and non-academic supports, and career guidance.

In principle, tests could be designed to isolate contributions of discrete components as well as program bundles. One strategy involves randomly assigning subsamples to alternative versions of a program, perhaps varying credential options and sequences. Another approach involves estimating (non-experimentally) relationships between program-level design factors and impacts for a collection of experimental sites offering suitable variation in such factors. In principle, differences in credential and qualification designs might be parameterized for this purpose.[49]

For career pathways initiatives aimed at wider systems changes, there is typically no way to create a "business as usual" condition to which individuals can be randomly assigned. Under such circumstances, random assignment of clusters – such as classes, schools, or districts – may be a viable strategy. A great deal of selection already goes on in choosing localities to pilot new initiatives, or when resource limitations require phasing in sets of localities in stages. Similarly, federal agencies, state agencies, and foundations could utilize random selection in awarding competitive grants, perhaps after applicants meet threshold criteria. Cluster designs are increasingly common in evaluations of K-12 programs in the U.S.

Learning from Work

A central emerging principle in proposals to revamp post-secondary education and training in the U.S. is that career-focused programs should include substantial opportunities to learn directly from work experience.[50] There are many layers to this idea and diverse strategies for furthering it. The focus has been on partnerships with employers to identify jobs in demand and strengthen connections to jobs following training. Work-based training experience is an increasingly important rationale for these efforts, but the terrain of practices and possibilities for instilling it has not been well mapped.

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[48] See http://www.projectisis.org/.

[49] A cross-site analysis of this type is the main focus of a current U.S. evaluation of the federal HPOG program involving grants for training in health care. The prospects for developing parsimonious indicators of varying approaches to credentials and qualifications are likely to be much better when, as in this instance, the set of tests involve training in the same general occupational area.

[50] See, for example, Hoffman (2011) and Kuczera & Field (2013).

Promoting learning from work in the U.S.

Work-based learning is learning that incorporates work, especially work experience, and organizes curriculum around it.[51] It is based on several hypotheses. First, exposure to occupations of interest can help to stimulate knowledge and awareness of career options and improve career planning. Second, vivid connections to work can help make classroom training relevant and thereby boost motivation and engagement in studies. Third, there is a growing belief that many important skills and insights may be learned best through practice in real problem-solving situations. Finally, both through direct experiences with employers and through capabilities reflected in transcripts or resumes, strong connections with work during training can facilitate transitions to relevant jobs and promotions after training.

In surveying work-based learning in the U.S., a useful distinction is between mainly classroom-based and workplace-based approaches.

School-based approaches. These strategies involve bringing realistic experiences and problems from relevant work situations into education and training. Major forms include exposure to occupations through visits to and from employers, contextualized and project-based learning focused on authentic work problems, and simulated work environments.

There have been increasing calls for greater use of contextualized, problem-based approaches in basic and developmental education, but evidence on extent and effectiveness of such practices is weak.[52] There has been no quantitative survey of practices. A recent qualitative study of basic skills instruction in California community colleges found individual instructors using interactive, constructivist pedagogies but few signs of wider systemic adoption (for example, in curricula).[53]

There have been several evaluations of programs aimed at integrated basic and occupational skills instruction. These studies outline different approaches to integrating instruction, but provide minimal detail on actual practices.[54] Several experiments have tested contextualized basic skills instruction as part of college bridge programs also including learning communities, intrusive guidance, and other components. Findings have been mixed.[55] For example, one widely-cited approach, the Center for Training Employment (CET) model, provided training designed to resemble a work environment, with integrated (i.e., contextualized) basic skills instruction. Two initial random assignment tests found positive employment and earnings impacts for the original CET site, but program impacts proved difficult to replicate in new settings.[56]

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[51] Definition adapted from Hoffman (2011).
[52] National Research Council (2012a), Perrin (2011).
[53] Grubb (2013).
[54] See Wachen et al. (2012), Fein & Beecroft (2006), and reports at: http://www.mdrc.org/project/learning-communities-demonstration#featured_content.
[55] See Fein & Beecroft (2006), Visher et al. (2012), Sommo et al. (2012), and Martin & Broadus (2013).
[56] Miller et al. (2005); Barnow & Greenberg (2012).

One of the most comprehensive and well-implemented models for work-based vocational training is the national Job Corps program, a residential program for disadvantaged youth aged 16-24. As part of a rigorous evaluation, researchers provided a wealth of detail on curriculum and instruction.[57] The program provides the equivalent of about a year of intensive academic and vocational instruction in more than 75 trades, making heavy use of project-based learning and work experience. It generated substantial impacts on hours of education and training and receipt of GEDs and vocational certificates. Job Corps produced modest positive impacts on employment and earnings. Though benefits did not outweigh program costs for the overall sample, the program had larger earnings impacts and was cost-beneficial for older youth.[58]

The early 2000s brought growing interest in "sectoral" initiatives emphasizing partnerships between training providers and industry to develop short-term programs in rapidly growing job sectors. Implementation research has focused on general aspects of these partnerships: there is little documentation of the prevalence or nature of work-based instruction in programs.[59] Two impact studies using experimental designs found substantial positive impacts on employment and earnings over a two-year time horizon.[60] Whether these results can be scaled up and sustained remains to be seen: programs were run by highly capable community organizations, targeted carefully-screened applicants, and mostly did not articulate with follow-on training.

Findings from qualitative studies suggest that partnerships with employers are difficult to sustain and typically wane over time.[61] Similar challenges have dogged efforts to connect employers with workforce agencies in the WIA system more broadly.[62] There is little evidence on the usage by these short-term programs of simulated or actual workplace situations.

The Department of Education includes "innovative educational approaches" in its list of core principles for CTE programs, but does not collect data on the extent to which community colleges actually are using innovative practices.[63] A recent paper by scholars at the National Center for Career and Technical Education observes that few CTE instructors use project-based learning—one of the more important forms of work-based learning in the classroom.[64]

Several writers have cited "cooperative education" models as likely sources of promising classroom-based practices.[65] Cooperative education places a strong emphasis

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[57] Johnson et al. (1999).
[58] Schochet et al. (2008).
[59] Pindus et al. (2004); Roder et al. (2008); Conway et al. (2012).
[60] McGuire et al. (2010), Roder & Elliot (2011).
[61] 2011 personal communication with P/PV Sectoral Employment Impact Study staff; Pindus et al. (2004); Roder et al. (2008).
[62] See Decker (2011) for a summary of WIA implementation literature.
[63] Annual summaries of each state's CTE system and improvement activities may be found at https://www.acteonline.org/stateprofiles.aspx.
[64] Stipanovic et al. (2012).
[65] Hoffman (2011), Symonds et al. (2011).

on work-integrated learning on campus, as well as on off-campus work experiences (see next section).[66] The model is used by a small fraction of four-year colleges, and its effectiveness has not been rigorously evaluated.[67] A survey of classroom practices and tests of models adapted for nontraditional student populations would be useful.

Workplace-based approaches. Workplace-based training is not widely available to economically disadvantaged youth and adults. Some promising strategies—internships, service learning, and cooperative education—are available mostly through four-year college programs.[68] Health care—one of the most rapidly growing fields—is an exception, with clinical internships required in many short-term certificate and associates degree programs. A number of recent federal grant programs have targeted disadvantaged students for health care training.[69] Another exception is the national Year Up program, which provides internships in IT and financial services to disadvantaged youth (see profile later in this section).

Service learning, common mostly in the U.S., is defined as "voluntary work of an altruistic nature, often in nonprofit organizations, with the goals of helping the community and learning simultaneously."[70] Many traditional U.S. colleges and university programs offer service learning opportunities, but they have not been generally available to disadvantaged populations.

Beginning in the early 1990s, Congress established a series of national service programs, including two focused on disadvantaged youth—Youth Corps and the Americorps National Civilian Community Corps (NCCC). Managed by a separate agency (the Corporation for National and Community Service), these programs underscore the fragmented nature of employment and training systems in the U.S.—each stand-alone service program establishes its own systems and relationships with local community colleges and employers. A random assignment evaluation of Youth Corps found little evidence of impacts on post-participation education and employment, and non-experimental evidence for NCCC similarly was disappointing. Perhaps improved efforts to align the nature of work and related training with longer-term career plans would lead to improved outcomes.

Colleges using a cooperative education model have demonstrated the feasibility of generating a substantial number of short-term jobs with local employers that are well integrated with programs of study.[71] Most of these colleges are four-year colleges serving traditional students, but some community colleges also have begun cooperative education programs—La Guardia Community College in New York is a notable

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[66] On work-integrated learning curricula more generally, see Smith (2012).

[67] Karsten Zegwaard, personal communication, April 2013.

[68] A qualitative study of career guidance at 15 community colleges found that internships and other forms of work experience rarely were used to introduce students to careers of interest (Grubb 2006).

[69] An example is the Health Professions Opportunity Grant program, administered by the Administration for Children and Families at the Department of Health and Human Services.

[70] Hoffman (2011, p. 109).

[71] One of the best known is the co-op program at Northeastern University, which placed nearly 7,000 students in co-op jobs with just over 2,000 employers in 2010-11 (see http://www.northeastern.edu/coop/quick-facts/).

example.[72] More extensive adaptation and testing of this model for nontraditional students would be valuable.[73]

Although U.S. employers spend billions of dollars per year on training for incumbent workers, the vast majority goes to training for college-educated workers: relatively few low and middle-skill employees receive training.[74] Analysts hypothesize that employers believe investments in general skills training (typically the training most needed by lower-skilled workers) will be wasted due to high turnover and because balance sheets do not account for returns to skills investments.[75] Non-experimental studies suggest that government grants to incentivize incumbent worker training by firms can improve workers' performance and earnings.[76] Newer federal grant programs such as TAACCT have been designed to stimulate partnerships between employers and community colleges aimed at increasing training of lower-skilled incumbent workers.[77]

Apprenticeships in the U.S. are concentrated in construction and manufacturing and represent a smaller share of the workforce than in many OECD countries.[78] The suitability of this approach to work-based learning for disadvantaged youth seems high, and non-experimental studies have found positive returns.[79] Relatively modest federal and state investments appear to be able to generate good uptake from industry.[80] These findings, and positive experience in Europe, have prompted calls for expanding apprenticeship programs in the U.S.

The rapid growth in computer-based and online learning technologies has opened a range of possibilities for training incumbent workers for middle-skill occupations. In principle, these technologies afford more flexible routes to earning marketable credentials while balancing work, training and family responsibilities. More traditional forms of online learning (e.g., virtual lectures, e-mailed homework) require greater self-discipline and may be less well-suited to economically disadvantaged students than classroom-based instruction.[81] However, technologies are evolving in ways that may provide more engaging and motivating online experiences, and interest in blended online-classroom models is growing. This mounting emphasis is illustrated in the strong core emphasis on

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[72] http://www.lagcc.cuny.edu/coopedu/.

[73] Hoffman (2011).

[74] Estimates of total spending by employers vary widely, from $50 billion (National Research Council 2012) to over $100 billion (U.S. Department of Education 2012, King & Heinrich 2011).

[75] See Hollenbeck (2013).

[76] Holtzer et al. (1993), Hollenbeck (2008). The National JTPA Study found positive impacts for disadvantaged adults assigned to receive some combination of on-the-job training and employment services, but it is not clear what training contributed to these impacts (Bloom et al. 1997).

[77] http://hechingerreport.org/content/impatient-employers-step-in-to-educate-prospective-workers_10937/ and other stories at http://hechingerreport.org/category/special_reports/learn-and-earn/

[78] In 2010, there were nearly 450,000 registered apprentices in the U.S. (Reed et al. 2012) and perhaps a similar number of unregistered apprentices (Lerman 2009).

[79] Lerman (2009, 2012); Reed et al. (2012).

[80] Lerman (2009, 2012) and others often cite South Carolina as evidence on the potential for most public funding to expand apprenticeships. See http://www.apprenticeshipcarolina.com/.

[81] See Jaggers (2011) and Figlio et al. (2010).

advanced online and technology-enabled learning in DOL's announcement of the final ($500 million) round of competitive TAACCCT grants.[82]

Subsidized and transitional employment programs would seem to be a natural vehicle for work-based learning for low-income groups.[83] Such programs usually have provided little training, however, and most evaluations have found them to have little impact on regular employment. Several tests of older programs that did provide short-term training to low-skilled adults found positive employment and earnings impacts.[84] Further experimentation with middle skill jobs and related training seems warranted.

Part-time work study jobs helping financially needy students earn their way through school are another form of publicly subsidized employment for which potential synergies with career pathways could be much better exploited. The federal government spends nearly $1 billion on such jobs, and states also operate programs. There is no evidence on the degree to which placements relate to occupational areas of study, as encouraged in federal guidelines, though the most familiar examples—clerical work on campus and in local community organizations—suggest that this is not common. Some states are making use of work study jobs to support post-secondary education and training for welfare recipients, as a way to lengthen training allowed under Temporary Assistance to Needy Families.[85] In these states – notably, Arkansas, California, and Kentucky – policies and practices emphasize matching to recipients' occupational goals; again, the extent to which such matching occurs has not been ascertained.[86]

Finally, a majority of low-income students work while going to school—often in full-time jobs with no relevance to studies.[87] Strong negative correlations between work and school outcomes have prompted calls for increased financial aid for nontraditional students.[88] But curricula might also be able to leverage this work experience—for example, through assignments requiring application of English, math, and psycho-social skills to challenges at work.

Illustration: Work-based learning in Year Up

Nancy Hoffman summarizes the rigors programs face in striving to become a "pocket of excellence" in a context of generally weak and fragmented systems:

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[82] See http://www.doleta.gov/grants/pdf/SGA-DFA-PY-13-10.pdf.

[83] In 2009-10 about a quarter of a million people were placed in subsidized private sector jobs funded by the American Recovery and Reinvestment Act (ARRA).

[84] Bell & Orr (1994); Orr et al. (1996); MDRC (1980).

[85] Person et al. (2008); Bone (2010).

[86] Scott-Clayton (2011) provides a useful review of the evidence on the overall effects of federal work-study on school outcomes, and new non-experimental findings of negative effects on BA completion within four years. Together this evidence suggests that working can inhibit success in traditional college programs. It does not address the question of whether and how, for students who must work in any regard, work can be designed to support rather than compete with education and training.

[87] U.S. Department of Education (2012).

[88] See Bound et al. (2010), Jepsen et al. (2010) and Scott-Clayton (2011) for evidence, and Goldrick-Rab & Sorensen (2010) and Reimherr et al. (2013) for policy recommendations.

[T]hose programs that do attempt to connect struggling young people with training for work must fight all the battles on their own: they must develop a preparatory curriculum, simulate the workplace or seek work placements from sympathetic employers, and hope that without an apprenticeship wage students will be motivated to show up, and employers will be able to handle the likely eventualities… [So that] the endpoint is an adult job, and the options are transparent for further education. (Hoffman 2011, p. 165)

Year Up, an exemplary work-based learning model for disadvantaged youth, attests to the exacting requirements for stand-alone programs and challenges in bringing them to a wider scale. A one-year program operating in eight major U.S. cities, it provides training in IT and financial services to 1500-2000 youth aged 18-24 yearly. It targets economically disadvantaged but motivated youth with a high school diploma or equivalent degree. The program is divided into two phases.[89]

During a six-month "learning and development phase," participants receive customized training in technical skills and in behaviors required for success in corporate environments. The curriculum, developed in close partnership with local employers, is highly interactive and problem-based. The program simulates the workplace environment by establishing standards for dress, attendance, and conduct and providing weekly stipends determined by a point system connected to these standards. Students whose infractions erase all of their points are considered to have "fired themselves" and must leave the program. Through regular weekly meetings, staff and peer-to-peer feedback is used to help individuals process their experiences within and outside the program. Visits to and from employers, individualized career planning, and careful matching of skills, interests, and temperament prepare the way for transitions to the program's second phase: a six-month internship.

During internships, participants work regular hours in entry-level career positions with major employers such as American Express, JPMorgan Chase, AOL, Google, and Kaiser Permanente. Employers provide supervision and pay Year Up over half of the program's total cost of about $25,000 for each student. In addition to their workplace supervisor, each participant is paired with an outside adult mentor, maintains contact with Year Up advisors, and spends a half day each week at the program's offices in group and one-on-one feedback and support sessions. They continue to receive stipends during the internship phase.

Upon completion, students receive up to 18 credits from the program's community college partners. The program provides continuing advising and mentoring supports, and maintains an active alumni network.

A self-improvement ethos is evident in strong internal monitoring systems and active collaborations with outside researchers. The latter include several descriptive studies, a small random assignment test, and current involvement in a large experiment as

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[89] For descriptions of Year Up, see Chertavian (2012), Grobe, T. et al. (2010), and Workforce Strategy Center (2009).

part of the ISIS evaluation. The early experiment found substantial positive impacts on earnings of $3,461 (30 percent), in the year following the program.[90]

Year Up's founder created the program whole cloth. A former internet entrepreneur with a Harvard MBA, Gerald Chervatian was well equipped to network with the U.S. business and philanthropic elite to secure funding and recruit major firms to provide supervision, funding, and placements for interns. He studied the literature and examples from U.S. and Europe and, working with employers, developed a new curriculum and program model. He assembled a leadership team from elite universities to create a platform for national expansion. This team has put substantial effort into developing processes, procedures, and manuals to support high fidelity replication and expansion—codifying processes for developing employer partnerships and internship positions, for example.

The organization nonetheless believes that the costs and administrative requirements for expansion place constraints on the scale feasible for its original stand-alone model. So it is planning to cap growth in the core program at about 2,500 participants. Meanwhile, Year Up leadership has launched an initiative – the "Million Person Model" – to pilot adaptations for systems where greater scale and sustainability are possible. Pilots are currently underway in several community college systems. These programs integrate suspected "active ingredients" from Year Up's core program – such as professional skills courses, "high expectations, high support" mechanisms, and internships – with community college courses and infrastructure. The initiative offers opportunities to explore variations such as longer programs of study and programs in varied occupations.

Research and evaluation on work-based learning

As the foregoing indicates, there are many contexts where work-based learning could be provided in the U.S., but—aside from a few well-documented programs like Year Up—the opportunities are poorly charted and generally underused. For the most part, researchers have not focused on these aspects in evaluating programs embodying promising approaches bundled with diverse other components. This is an important gap given surging interest in work-based learning approaches.

Extent and nature of promising work-based learning practices. For most of the settings reviewed earlier, good documentation of work-based learning practices is lacking. One helpful step would be to survey practices in key settings such as community colleges, ABE programs, career pathways grantees, national service providers, and registered apprenticeship programs.

Promising practices identified in these surveys then could be studied in greater depth. Many interesting questions arise. What pedagogical methods and technologies are being used to introduce real and simulated work situations in basic and vocational skills instruction? What is involved in developing work study positions matching to programs of study? Under what conditions and using what approaches do some firms

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[90] The sample in Roder & Elliot (2011) was limited to three locations and, after survey nonresponse, was only 164. The ISIS experiment will enroll a sample of over 2,000 youth in eight cities and measure an extensive array of outcomes.

invest more in training lower-level employees? What kinds of supervision and training do apprentices receive?

Improved protocols for field studies of promising work-based learning practices would be useful to incorporate in existing and planned evaluations of pertinent programs. A dedicated project to develop better instruments and associated research methods might help to prompt this.   An increasing number of federal programs involve separate evaluations for individual grants, with an overall technical assistance contractor working across teams to promote quality and consistency. Such arrangements provide natural conduits for disseminating these and a wide range of other improvements in evaluation methods.

Estimating receipt and outcomes of work-based learning. Better data also are needed on exposure to work-based learning and associated characteristics and outcomes. Existing data cover only some forms of activity and provide little detail. Administrative records can be used to calculate basic statistics for some activities such as registered apprenticeships, national service programs, and federal and state work study programs. But administrative data typically offer little detail and cover only services provided through specified programs. For example, the federal apprenticeship program maintains good data only on registered apprenticeships, and data on work study jobs is insufficient to assess fit to programs of study. Federal workforce development programs typically record basic employment-related experiences but rarely gather information about types of training associated with these experiences or whether education and training curricula use contextualized and project-based methods.

A variety of surveys collect data on post-secondary education and training and varying kinds of employment experiences (e.g., internships), but attention to curriculum and details of employer-based training is minimal. No federal agency has collected data on the prevalence of employer-based training since the end of the Adult Higher Education Survey in 2005.[91]

In addition to prevalence estimates for work-based learning, surveys also could measure outcomes work-based learning is designed to influence. As outlined earlier, these include improved career knowledge, academic motivation and engagement, skills acquisition, and success in employment and subsequent education and training. Investments in developing survey modules capturing work-based learning experiences and these outcomes could be very useful in a wide range of research situations. Perhaps a concerted assessment of federal data collection on work-based learning and recommendations for improved data collection could be incorporated into the work plan of the Interagency Working Group on Expanded Measures of Enrollment and Attainment (GEMEnA).[92]

Impacts of work-based learning. There is little solid evidence on most forms of work-based learning. Many strategies have not been subject to any impact analysis (e.g.,

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[91] U.S. Department of Education (2012).

[92] See http://nces.ed.gov/surveys/gemena/ for information on activities of this working group.

classroom-based approaches, cooperative education). Others have been evaluated only using non-experimental methods (e.g., apprenticeships, incentives to train incumbent workers) or in experimental tests of programs in which learning was not a primary objective (e.g., work study, subsidized employment experiments). Other experiments have tested programs including work-based learning, but have not measured exposure to different forms or estimated their contributions to overall impacts. Experiments designed to assess these strategies specifically are needed. Including measures of proximate outcomes as outlined above in evaluation follow-up surveys would be valuable in testing hypotheses about the causal channels through which work-based learning strategies improve primary education and employment outcomes.

Emerging Integrative Initiatives

The foregoing sections examine several key strands in efforts to improve access to jobs requiring post-secondary education and training. Much of this activity has focused on particular policy domains, programs, and intervention strategies. Yet it is increasingly recognized that the U.S. must figure out how to weave strands into coherent and easily navigable systems providing skills training, credentials, supports, and employment.

In response, there has been an unprecedented surge in integrative initiatives by private foundations, federal and state agencies, industry groups, professional bodies and non-profit organizations. These initiatives target diverse and often overlapping actors and objectives. In this section I sketch efforts in two key domains—foundation and federal, including some initiatives mentioned earlier in this paper—to illustrate some of the challenges being addressed and areas where greater coherence across initiatives would be helpful. The paper's final section considers prospects for adopting a framework that could support improved alignment of initiatives.

Foundation initiatives. A series of foundation projects has engaged various configurations of states and community colleges in efforts to realign policies and systems to improve college access and completion. Theories of change hinge on the idea that systemic change can be catalyzed by engaging states and colleges in structured planning processes, providing technical assistance and modest funds to support these processes, and building "learning communities" across participating institutions to disseminate best practices.

Some projects have worked directly with colleges (e.g., Achieving the Dream, Breaking Through), whereas others have focused on statewide systems and agencies (e.g., Shifting Gears) and others have engaged both (e.g., Completion by Design, Accelerating Opportunity). Two initiatives have focused on connections between ABE and college systems (Breaking Through and Accelerating Opportunity). Geographic coverage varies: some states and colleges have been involved in multiple initiatives, while others have been involved in none. Some initiatives have overlapping aims, others do not.

Coordination across initiatives is largely informal and variable. Informal coordination has been facilitated to a degree by involvement in multiple initiatives by

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some foundations and intermediaries. In particular, a single non-profit—Jobs for the Future—has played a leading intermediary in a majority of the foundation projects. In this capacity, JFF has been able to promote a degree of coherence by building on knowledge and tools, as well as relationships, across initiatives. For example, JFF recently created a Postsecondary State Policy Network comprised of states participating in three other initiatives, each with their own peer networks. The proliferation of peer networks and online resources and toolkits created by foundation (and federal initiatives, as noted below) may be complicating somewhat the task of finding help.

There are also challenges in aligning evaluations across foundation initiatives. Most of these projects have commissioned third-party evaluations focused on policy and system change processes and the apparent results of these processes. Thus, most foundations are in a position to cite examples of state and college policies and programs originating in their initiatives. However, impacts on policies, systems, or student outcomes are difficult to gauge due to the multiplicity of other initiatives and processes simultaneously at work. And each evaluator has taken a different approach to measuring systems change. Although necessary to a degree given different approaches in initiatives studied, it will be difficult to render a coherent assessment of the net effects of foundation efforts.[93]

Federal initiatives. The White House has introduced a government-wide approach to coordinating job training initiatives through "Cross Agency Priority (CAP) Goals" and related inter-agency activities.[94] The broad goal for the job training CAP is to "ensure our country has one of the most skilled workforces in the world by preparing 2 million workers with skills training by 2015 and improving the coordination and delivery of job training services." Major objectives include delivery of effective and efficient job training programs, better coordination of current programs, and increased accountability and use of information about what works to drive improvement.

Strategies developed to date include proposals requiring Congressional approval and initiatives that can be taken under existing authority. As examples of the former, the administration's proposed FY 2014 budget includes $8 billion for a Community Colleges to Careers Fund; $12.5 billion for a Pathways Back to Work Fund; and reforms to WIA (e.g., innovation grants and streamlining measures) and Perkins Act (e.g., strengthening the quality of CTE programs and increasing incentives for innovation).

Using existing authority, federal agencies have implemented a series of competitive grant programs; launched technical assistance projects to promote career pathways programs; and sought to strengthen the evidence base on a wide range of

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[93] A degree of overlap in evaluators across initiatives has injected a degree of consistency in approaches. For example, at least two initiatives (Achieving the Dream and Completion by Design) are using a "Loss and Momentum Framework" developed by researchers at CCRC to measure outcomes for college completion initiatives. MDRC's involvement in the several initiatives has led to better-specified measures of systems change and to the development of random assignment tests of a limited number of discrete program approaches.

[94] See status report for job training CAP goal at:
http://goals.performance.gov/sites/default/files/images/Job%20Training%20CAP%20Goal%20-%20FY13%20Quarter%202%20Update.pdf.

related approaches. Grant programs with strong integrative aspects include: the Trade Adjustment Assistance Community College and Career Training (TAACCCT) Grants, H1-B Technical Skills Training Grants, Workforce Innovation Fund (WIF), Health Professions Opportunity Grants (HPOG), and precursor training programs funded by the American Recovery and Reinvestment Act of 2009. These programs target different sectors and types of institutions but share an emphasis on comprehensive, innovative, and evidence-based strategies for engaging and promoting success of economically disadvantaged youth and adults in post-secondary education and training. Most explicitly embody the career pathways framework. With recent congressional passage of a major reauthorization of the Workforce Innovation Act—as the Workforce Innovation and Opportunity Act—the career pathways framework has been woven into the fabric of national policy.

Federal agencies have taken significant steps to establish career pathways as the framework for guiding development of these and related efforts. Three major agencies – the U.S. Departments of Education, Health and Human Services, and Labor – recently released a landmark letter committing to coordinated support for career pathways approaches and providing a broad overview of the career pathways framework. This letter was the result of work by an informal interagency staff group, which also has coordinated several conferences to foster national dialogue and alignment on career pathways and is in the process of analyzing responses to a call for public input.

The Departments of Education and Labor have funded a series of career pathways technical assistance projects. One project was a Department of Labor-sponsored initiative in 2010-11 providing technical assistance to a group of states and creating an online career pathways toolkit for wider use. The Department of Education is managing a growing portfolio of projects to promote quality career pathways programs and systems. Its Policy to Performance project (2009-2012) developed a model for ABE to post-secondary transition systems and worked with eight states in applying the model to their policies. A current project – Advancing Career Pathways for Career and Technical Education (2012-14) – is working with five states to integrate CTE programs of study into broader career pathways system development efforts already underway. A third project – Designing Instruction for Career Pathways (2010-13) – is developing and providing a clearinghouse for exemplary curricula and instructional materials. A fourth project – Technical Assistance for Developing Career Pathways (beginning in 2013) – will engage 11 additional states in policy and systems development.

The goals, methods, and intermediaries (contractors) in these initiatives overlap with the foundation initiatives described earlier and, again, involve varying configurations of states. Like the foundation initiatives, they aim to stimulate systemic change through technical assistance and tools. The proliferation of online toolkits has accelerated to a point that practitioners may be finding it difficult to navigate resources developed to facilitate navigation.

Another front of federal activity involves cross-agency efforts to improve data and reporting systems and tie policies and funding to results. These efforts include investments in state longitudinal data systems supporting analysis of experiences in

public programs, post-secondary education and training, and employment. They also include efforts described earlier in the paper development of improved definitions and measures of diverse credentials in national surveys.

Closely related to programmatic and data initiatives have been efforts to promote rigorous evaluation and greater dissemination and use of results. Office of Management and Budget directives have promoted more extensive and rigorous evaluation of formula and competitive grant programs, as well as increased use of evidence in funding decisions. To support these initiatives, White House staff members are working with agencies to adopt rigorous and consistent standards for strong evidence.

In the trenches, however, promoting rigorous evaluation is an ongoing battle. Major programs such as TAACCCT and WIF that rely on locally-commissioned evaluations are especially vulnerable to uneven local expertise. Although grantees have been provided technical assistance and encouraged to use random assignment, many have been allowed to use other designs and there typically is little coordination of research questions and measures across studies. Sometimes non-experimental approaches are necessary (e.g., when systemic change leaves no "business as usual" counterfactual), but other times potentially surmountable administrative issues and negative perceptions trump experiments. Random assignment has fared better in programs where agencies opted for a single evaluator—examples include the H1-B, HPOG, ISIS, and WIA evaluations. But as measures for most outcomes across these studies are inconsistent, it will be difficult to synthesize their results. The Departments of Education, Health and Human Services, and Labor each have commissioned projects to review evidence in related domains: whether and how these are coordinated remains to be seen. Cross-agency working groups also have begun to explore how substance and methods can be better aligned across evaluations.

Career Pathways as an Organizing Framework

The foregoing sections have documented how efforts to forge coherent workforce development systems are themselves vulnerable to fragmentation. Two currents in recent workforce initiatives may provide the basis for a constructive response: improvements in executive branch coordination of goals and strategies across federal agencies (discussed above) and the ascendance in career pathways of a conceptual framework with potential to streamline diverse efforts.

Strengthening the career pathways framework. While looser formulations of career pathways principles have served to inspire initiatives, achieving a higher level of coherence across them requires tighter conceptualization of the framework and centralized responsibility for its development and promotion. In this section I trace key ingredients for a tighter specification.

The underlying assumption is that coherence requires a strong conceptual foundation. A tight conceptual framework is necessary, if not sufficient, to more systematic mapping of training programs and credentials, improved integration of

services and supports within programs and wider systems, well-targeted outcomes measurement at the program and system levels, judicious specification of hypothesized links between inputs and outcomes, and building cohesive evidence on these links to inform policy and practices.

The first steps to tighter conceptualization are developing rigorous classifications and a broad theory of change for career pathways interventions. Rigorous specifications require exhaustive, mutually exclusive categories and well-defined concepts and constructs. The state of related knowledge is imperfect—thus as in other areas of science, the effort will require ongoing revision and refinement based on emerging evidence.

In a previous paper, I described the career pathways framework and application to program design and evaluation.[95] In this framework several characteristics of programs can be considered as "basic" defining ones—organizational aspects (e.g., institutions/systems involved and roles of key partners and stakeholders), target populations (e.g., education and skill levels, age), and target occupational pathways lattices (including lattices and broader systems of credentials). Sturdy taxonomies within these basic headings are needed for useful classification of systems, programs, and more discrete program components. In the case of credential systems, taxonomies would be based on existing federal career and occupational classifications.[96]

The framework provides categories for classifying substantive intervention strategies that flesh out the above. Broad categories and illustrative strategies within these categories include:
- Assessment (e.g., of general and technical skills, in formative and summative applications)
- Core instruction (e.g., modularization and flexible delivery, contextualization, acceleration, active learning, technology)
- Supports (e.g., personal and career guidance, supplemental skills instruction, social supports, supportive services, financial assistance)
- Employment connections (work-based learning experiences during, placements after classroom-based learning)

In addition to these categories, interventions can be classified with respect to their approaches to several cross-cutting objectives: packaging courses and services to simplify students' choices, fostering a culture of evidence and continuous improvement, and maximizing scalability and sustainability.

Just as well-designed career pathways interventions are based on clear logic models, coherence requires the ability to situate program—specific models within a larger theory of change. In the earlier paper I outlined the basic components of a high-

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[95] Fein (2012).

[96] A number of career pathways initiatives and evaluations are using the following broad categories to provide a common basis for classifying steps across diverse occupational pathways: basic bridge program; sectoral bridge program, short-term (under 1 year) certificate, longer-term (1-2 year) certificate, associate's degree, bachelor's degree.

level theory of change for career pathways, based on the model we are using in the national ISIS evaluation. It summarizes relationships between comprehensive policy and program inputs (as summarized above) and intermediate target outcomes (such as skills, career direction, personal and family resources). It shows connections between these intermediate outcomes and the (inter-related) outcomes career pathways programs ultimately seek to foster (improved education and training attainment, career-track employment and advancement, and longer-term improvements in other life outcomes). Finally, it shows how each of these domains, and the connections between them, can be influenced by contextual factors such as local economic demand and policy and institutional environments.

The foregoing represents the highest level of a framework within which more detailed classifications can be nested. So developed, the career pathways framework would provide a common architecture within which diverse stakeholders and initiatives could build. As explained in earlier sections of this paper, this vision is not new— substantial planks have been laid already. Take the Department of Labor's occupational databases and career pathways models and tool and imagine linking them to credential databases and career readiness standards at the Department of Education.[97] In an integrated database, it would be possible to analyze existing credentials and pathways in a particular state, region or locality in relation to model credential systems and standards (as the latter develop).[98] For example, a national map for a particular manufacturing industry might show 5-6 possible career ladders with varying steps, and associated competency requirements. But data for a given region might show existing programs in only 2-3 pathways, and these programs might emphasize associate's degrees to the neglect of credentials leading to mid-skilled employment. Analysis of regional employment trends might suggest if the region's existing pathways were well matched to demand. In planning programs, a state concerned about improving access to college might query on college bridge programs and gauge their prevalence, auspices and contexts and see what evidence existed for impacts on basic skills, college entry and persistence, earnings and other outcomes.

In relation to the potential benefits and scale of initiatives already underway, a large undertaking of this type seems appropriate. Given a high-level architecture and platform for coordinating the work, there are likely ways construction could be modularized and staged. The edifice will to an extent never be finished—it will require regular updating and revision as practices evolve and concepts and measurement improve. A process for revisions could be based on updates from relevant federal agencies and any private organizations working on relevant standards and measures, and research. This would require a strong centralized national entity to develop and manage

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[97] Such efforts are in fact underway.

[98] The recent OECD report on the U.S. career and technical education (CTE) system recommended a version of this in which the federal government works with major industries to develop quality standards for certifications in different occupations. As described in that report, "[t]his does not mean a qualifications system designed top-down, but rather aims to establish a bottom-up, industry-driven set of standards that might underpin not just those particular certifications but also CTE certificate and associate degree programs in the same domain (Kuczera & Field 2013, p. 120)."

the work across relevant federal agencies and coordinate with state, local and non-governmental agencies, employer representatives, and institutions.

Creating a national platform to coordinate career pathways initiatives and research. As noted, the Obama administration has been active in efforts to improve coordination of federal programs, data systems, and evaluation relating to post-secondary skills training. For the most part, these initiatives have been opportunistic, based on staff interest and needs but not connected to any overarching framework. I have argued that nonetheless virtually all of these activities can be conceived as developing infrastructure for a career pathways framework.

As one example, a well-developed conceptual framework – with dimensions sketched above – could provide a useful classification tool to support inventories and analyses of existing federal, state and local workforce education and training programs as well as broader initiatives to foster system change. As another example, efforts to build state longitudinal data systems integrating records from public benefit, college transcript, and wage record systems address a number of key outcomes in the career pathways framework, as does work on improved measures of credential attainment in surveys and work elsewhere on measuring skills acquired and needed for specific occupations. To the degree that work on improved data and measures of success, as well as on strengthening systems—of credentials, instruction, supports, and employment connections—can draw on a strong body of guiding ideas, improved alignment may happen more naturally.

It has been widely recognized that career pathways can provide a powerful framework for organizing efforts to promote coherent and comprehensive system changes. As described above, these steps include the establishment of an informal career pathways working group of staff from the Departments of Education, Health and Human Services, and Labor, and efforts to build key career pathways principles into many federal grant programs and non-governmental initiatives. This movement thus far has been largely spontaneous and organic. Underlying it is the notion that ideas matter—and that producing a strong, well-organized body of ideas could provide natural channels through which positive change could flow to greater effect, even without major changes in national legislation.

Although career pathways principles have gained substantial traction through diverse, loosely-coordinated initiatives, a more concerted effort by a dedicated federal entity could help to channel promising efforts successfully. Such a platform could take various forms—for example, a working group, commission, initiative, or OMB staff unit. In establishing such a mechanism it might be useful to consult with OECD countries whose VET systems have some similarity to the U.S. and that have taken steps to plan against a clear vision and framework.

As an extension of initial consultations, this group might prepare and execute a 2-3 year work plan leading to a national blueprint for career pathways policy and research. One key task is to develop a conceptually rigorous and detailed statement of the career pathways framework grounded in a thorough review of the extensive but scattered, uneven and rapidly growing related research literatures. The National Research Council

would be a strong choice for this assignment. Another important task would be to establish a central mechanism for monitoring and coordinating programmatic career pathways initiatives. The focus here would be on creating space to identify and work through the tensions between and potential synergies across initiatives. A third task would be to strengthen bridges across data systems, identify gaps, and recommend replacements where new approaches are needed. The scope would cover data needed to describe and gauge service systems as well as measure outputs of these systems (e.g., skills, credentials, employment and advancement in and across occupations).

A final task would be a careful assessment of evaluations planned and underway and, engaging agencies and research organizations involved, take steps to strengthen substantive and technical aspects and better systematize emerging findings. Related research and evaluation is extensive but highly balkanized—mirroring the policy and program silos within which it is carried out, and notwithstanding many common substantive and methodological issues. The career pathways framework could – with high-level scientific effort along the lines sketched above – provide a potentially powerful device for organizing diverse findings in a more purposeful way. This would be a next-generation version of the What Works Clearinghouse (which currently contains very little evidence on interventions related to post-secondary education and training). To the extent that public policy is influenced by perceptions of the effectiveness of workforce development strategies, improved capacity to gather and weigh a large body of evidence in this arena could prove to be enormously useful.

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