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DANISH AGENCY FOR HIGHER EDUCATION

TRANS-ATLANTIC TECHNOLOGY and TRAINING ALLIANCE

A Symposium on Workplace Learning in Europe and the United States in June 2013

Trans-Atlantic Technology and Training Alliance,

Copenhagen, Denmark

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This paper highlights the presentations and discussions that took place at a symposium on June 18, 2013 in Copenhagen on the topic of workplace learning in vocational and technical education. The event was organized by the Trans-Atlantic Technology and Training Alliance and hosted by two Danish technical colleges, TEC in Copenhagen and EUC-Syd in Sønderborg. The TA3 is an international alliance of community and technical colleges that was managed in Europe by the Danish Agency for Higher Education and in the U.S. by Regional Technology Strategies, Inc. The Corporation for a Skilled Workforce (CSW) now supports the TA3in the U.S.

I. Prologue

There is growing interest internationally in work placed learning (WPL), not only in occupational education and training, but as an integral feature of educational pedagogy in general. The intensity, place, organizational and legal frameworks, depth, intended outcomes, and degrees of integration between learning in institutions and in work settings vary from country to country and company to company. Apprentice based vocational education and training systems are one particular model of work-based learning. Increasingly, apprentice based education and training systems are being regarded as a panacea for all sorts of challenges, such as the skills gaps, high youth unemployment rates, and the need to develop a more innovative workforce in emerging sectors of the economy[1].

In both the US and European Union, the German, Austrian, Swiss and Danish apprenticeship systems are often held up as benchmarks from which the U.S. and other European countries can serve as a model for change.. However, while there is value in sharing lessons about models of work based learning in the wider contexts of employability, innovation, and productivity, each occupational education and training system and apprenticeship typology is deeply embedded in specific national and regional labor markets, industrial relations, and societal expectations, each with local variations. Thus simply replicating European models will not work.

In the U.S., support for some form of requirement for work-based education has ebbed and flowed over the years. But within the public education system, it never achieved the depth and stature or the employer involvement that the apprenticeship system has in many parts of Europe. Beginning in the 1980s, when western European (and Japanese) industry began outcompeting U.S. manufacturers, American industry recognized the need to modernize, which in turn required higher technical skills. In this new competitive arena, U.S. educators began to look at the most successful European practices for both industrial modernization and technical education.

During this period, delegations of government officials, educators, and business people visited Western Europe to learn about technology transfer and workplace education practices and policies, particularly from Germany, the Netherlands, Denmark, and Northern Italy. They observed European-style dual systems, which resulted in a stream of studies, policy briefs, commissions, and panels citing the European dual system as evidence of successfully combining learning and work. Many recommended increased investment in apprenticeship models of workplace learning.[2] The National Tooling and Machining Association, for example, was an early champion establishing "MechTech" as a pilot shared apprenticeship program among networks of member companies in both Rhode Island and Massachusetts.

One result of the knowledge gained from Europe was the National Youth Apprenticeship Act of 1992, which drew widespread support from educational

[1] See for example the OECD/ILO, EU G20 conference on apprentice systems, which took place in Paris, April 2014.

[2] James Rosenbaum, et al, Youth Apprenticeship in America: Guidelines for Building an Effective System, Washington, DC: American Youth Policy Forum, 1992.

reformers. Yet despite the federal and private foundation support, it proved difficult to implement apprenticeship programs at scale. The European system was based on making career choices and entering a vocational career path at age 16 and students finding positions with an employer. In the U.S. too few employers had the patience and willingness to invest time and money in apprentices over an extended period of time as well as the belief that this was not part of their societal responsibility. Furthermore, vocational education—even though now called career and technical education—was out of favor because if its history of tracking and low status among students and parents.

As a result, efforts to create apprenticeship programs within America's educational landscape have been scattered.[3] The major successes have been in places where large numbers of western European employers (particularly German companies) located their manufacturing plants in the U.S.). These employers understood the apprenticeship system and have been willing to invest time and resources. Several states—some influenced by intermediaries willing to provide the support systems—have piloted apprenticeship program on a small scale. In 2013, 1,900 Wisconsin apprentices worked in 1,300 companies, and the Governor and legislature recommended expanding the program and increased funding for next year. South Carolina, which provides tax credits for apprenticeships, has seen participation expand six fold since 2009.[4] Its program currently has 4,500 students at more than 600 companies in the state, with the typical apprentice in his or her late 20s. The goal is to involve 2,000 companies by 2020.[5]

Overall, however, "Apprenticeships only account for a small and declining share of employment in the United States compared to central European countries…"[6] There remains a wide-spread belief in the U.S. that a less specialized education in high schools and increasing baccalaureate credentials better serves students' careers and that "tracking" into career and technical education, even if it allows for pathways to higher education, perpetuates existing class inequities.

Two decades after the National Youth Apprenticeship Act, efforts to rebuild the middle-skills work force through career and technical (vocational) education and community colleges are once again on the front burner of the national policy agenda. The recent announcement of President Obama's proposal to double the number of apprentices in the United States over the next five years and the resurgence of interest in career and technical education is in part a reaction to the drive to increase higher

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[3] The U.S. does have a registered apprenticeship programs overseen by the U.S. Department of Labor Office of Apprenticeship. There is no direct federal funding for apprenticeship programs, but the Office of Apprenticeship supports programs that seek federal recognition through regulations, technical assistance, maintenance of a national database, issuance of certificates, and promotional activities. In FY 2012, more than 147,000 individuals nationwide entered that apprenticeship system.

[4] Stuart E. Eizenstat and Robert I. Lerman, "Apprenticeships could help U.S. workers gain a competitive edge." Washington Post, May 3, 2013.

[5] Nelson Schwartz, "Where Factory Apprenticeship Is Latest Model From Germany,: New York Times, November 30, 2013.

[6] Anthony Carnevale, Tamara Jayasundera, and Andrew R. Hanson, Career and Technical Education: Five Ways that Pay Along the Way to the B.A. Washington, DC: Center on Education and the Workforce, Georgetown University, September 2012.

education completion and the evidence that half of college graduates are in jobs that do not require a baccalaureate degree.

The Pathways to Prosperity initiative, originally developed by the Harvard School of Education in 2011, states that "Work-linked learning should play an especially important role in the new American system of pathways to prosperity…. Indeed, work-linked learning appears to be a key reason why countries with the strongest VET systems—in which over half of young adults participate in apprenticeships—are surpassing the U.S. in both educational attainment and in employment of young adults aged 20-24."[7]

The current focus on workplace learning today is the culmination of three developments: 1.) the American history of limited scale and hesitancy to embrace workplace learning in the U.S.; 2.) the changing business environment in the U.S., which can recreate the well-tested and deeply embedded programs in some European nations; and 3.) the growing acknowledgement of the value of workplace learning across the curricula.

Subsequent events proved the choice timely. In April 2007 Vice President Joseph Biden announced the formation of a consortium of colleges and businesses and labor leaders that seeks to develop a more widespread and consistent framework for awarding college credit for apprenticeships. That was followed by President Obama's announcement of a $550 million investment in training for new jobs through community colleges and apprenticeship programs.

II. Copenhagen Symposium, 2013

Copenhagen was the site of the Trans-Atlantic Technology and Training Alliance (TA3) 21 international symposium and meetings hosted by two Danish member technical colleges, TEC in Copenhagen and EUC-Syd in Sønderborg. The focus was workplace learning, a subject of renewed interest in countries where, if it existed, is limited are now reexamining its role in light of today and tomorrow's economy.

The purpose of the meeting in Copenhagen provided an opportunity to those participating to re-consider workplace learning to learn from countries where apprenticeships are an integral part of their systems of education—notably Denmark, Germany, Austria and Switzerland—the acknowledged leaders among the 24 EU countries that offer some form of apprenticeship. Community colleges in the U.S. operate at the edges of apprenticeships and WBL with cooperative education programs and internships but very few have full-blown apprenticeship programs, in part because so many students have full or part-time jobs and in part because of insufficient business interest and/or commitment. At the secondary level in career and technical education, the demands of academic rigor, STEM, and testing constrain not only the time available for occupational programs but pedagogy.

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[7] Harvard Graduate School of Education, Pathways to Prosperity Meeting the Challenge of Preparing Young Americans for the 21st century, Cambridge: Harvard University, 2011.

The Copenhagen Symposium explored ways that different institutions and different countries balance the requirements of a more demanding workplace with the value of experience and how they integrate "learning by doing" into their curricula—the highlighting of the methods, strengths and weaknesses, benefits, and future of the various models.

Plenary speakers included:

- Roland Østerlund, former director of Denmark's Vocational Education and Training System, who explained the Danish system and some of the issues it facing today;
- Robert Schwartz, professor at Harvard and co-author of *Pathways to Prosperity*, who discussed the potential of apprenticeship programs in the U.S. for improving the image of vocational education, reaching less advantaged populations, and bettering their career opportunities;
- Vibe Aarkrog, Associate Professor, Aarhus University, who described the pedagogical advantages of the dual system;
- Hanne Shapiro, Danish Technological Institution, who presented an overview of EU countries and forms of workplace learning; and
- Ursula Scharnhorst, Swiss Federal Institute for Vocational Education and Training, who described the Swiss system, highlighting the structure, demand, stakeholders, and balance among knowledge, know-how, and attitudes.

A. From the Podium

Professor Vibe Aarkrog of Århus University set the stage by placing workplace learning into a pedagogical context. The value of workplace learning, she noted, depends on the nature and quality of the experience. To turn a job into a valuable learning experience, students required the following elements: challenging tasks and experienced colleagues; being an active participant, not just an observer; and having sufficient time to absorb and reflect on what was learned. Workplace learning helps students understand the purpose of the classroom instruction by connecting it to real problems, participating in a community of practice, and motivates them. The learning is greatest when the tasks are complicated.

He noted that some of the challenges for apprenticeship programs included students: drawing experience from only one workplace; being expected to be imitators rather than problem solvers; insufficient connections between theory and practice; lack of clear and immediate feedback; and failing to understand the "why" (i.e. the theoretical underpinnings of the job). Further, learning from a skilled craftsman may not expose the apprentice to problem solving unless the craftsman ensures that the apprentice has opportunities to work on authentic and complex problems.

Hanne Shapiro, Head of Department at the Danish Technological Institute, broadened the discussion to policies and practices across Europe and put them into the context of the current global economic crisis based in part on her research for European Commission and OECD. Is VET a remedy, she asked, to address unprecedented high

youth unemployment in Europe given that countries with strong VET systems have lower rates of youth unemployment? Increasingly, strengthening VET has been advocated by the European Commission, the OECD, and the International Labour Organization, leading to the establishment of the European Alliance for Apprenticeship. Although it is true that workplace learning develops skills, creates a positive bond between employers and low-income youth, and improves transitions to work, it is not a total solution to the wider structural factors that frame unemployment and underemployment.

Some of the new policy measures, Hanne noted, include funding for apprenticeships abroad, helping countries with weak workplace learning systems improve them, encouraging transfer of innovative practices, and expanding informal and open learning. Apprenticeships are also pathways for adults. In Denmark, adults over 25 may become adult apprentices through accelerated pathways that involve validation of prior learning. There are expectations in Denmark that a recently proposed major reform of unemployment policies, if approved, can lead to an increase in unskilled, unemployed adults by making use of the opportunity to collect up to 90% of unemployment benefits for two years if they complete an apprentice program through an accelerated route.

In 2012, the number of apprenticeship positions in the EU was 9.4 million, comprising about 40 percent of all of secondary education. In 24 European countries, more than half of the learning occurs in the workplace. While there is a good match between supply and demand for labor in some countries, the financial crisis has taken its toll on the number of available apprenticeship placements in other European countries. Different models are being piloted to spur the creation of more apprentice positions, including financial incentives, outreach activities, flexible contractual arrangements, and the creation of apprentice centers where students can train in combination with shorter term contracts in a company. At the same time, the European Alliance for Apprenticeship has been created at the initiative of the European Commission and apprenticeship countries and strongly supported by a number of European companies.[8]

This is parallel to another initiative led by CEDEFOP (the European Centre for the Development of Vocational Training) and an agency under the European Commission which has contracted with the Danish Technological Institute, GHK in Belgium, and 3S Austria to develop a participatory apprenticeship review framework that will be piloted in Malta and Lithuania intended to be adapted and mainstreamed for use across the EU.

Robert Schwartz, Harvard School of Education provided both a U.S. context for workplace learning issues based on America's checkered history with vocational education and the expectations that education can solve economic and social problems, reflected in the current "college for all" policy goal. The fact remains that while a large number enter college in the U.S., the nation has the highest college dropout rate in the industrialized world.

[8] http://ec.europa.eu/education/policy/vocational-policy/alliance_en.htm

He balanced his critique of U.S. workforce issues with his impressions of the German apprenticeship systems, which he had observed as part of a recent 14-nation OECD study but also on a study tour 25 years earlier. The German system is a system that sorts students after grade four into a university track, a middle track that can lead to university or vocational training, and a track clearly leading to vocational education. Until recently, there was very little permeability in the European system to allow students to switch to other programs of study (i.e. higher education).

The issue of "tracking" has long been one of the major criticisms of vocational education in the U.S., resulting in the substitution of the term "vocational" by "career and technical" education. In Pathways to Prosperity, all paths are designed to allow access to higher education. One possible alternative, he suggested, is to adopt some version of the dual system but in career academies, early "middle" colleges, community colleges, and public urban universities, not public high schools, which go through grade 12 in the U.S., not grade 9 as in much of Europe. Employers, he believes, would be more apt to be part of a program with apprentices age 18 and above.

Such an effort might be most effective if it begins in sectors with positions that do not require a baccalaureate and have clear skill standards, such as health care or advanced manufacturing, or information technology. Working with Jobs for the Future, 15 states were invited to address the issues of the Pathways to Prosperity report and develop solutions that involved employers in those three sectors of the economy, a project still underway.

Roland Østerlund described the Danish System where the Apprenticeship Act was enacted in 1889. Workplace learning is an integral part of Danish national education. It begins in upper secondary school at about age 16 and programs are generally 2 to 4 years. The Danish differs from the German and Austrian systems. Utilizing a "sandwich" approach, the curricula include periods of about 10 weeks of classroom education in between 20 week periods on the job. Further, it is less specialized than the Swiss or German programs, with only 12 programs and 10 to 20 weeks of common foundation courses. Of the classroom subjects, a third are basic, a third are in the general trade category, a sixth in specific trades, and a sixth optional. There are no academic requirements, but all students under age 18 must have signed a training agreement with a business. The system is managed by the three "social partners," labor, industry, and government.

Key features of the Danish system are:

- Students must meet certain formal entry requirements in terms of grades in Danish and math. Students who do not fulfill requirements can be admitted, if they already have an apprentice placement, have completed another youth education program, or through a test
- The 12 entry fields have been replaced by four broad vocational areas
- The basic part of the program will be 40 weeks for students admitted directly from grade 9 or 10 and up to a year after they have completed compulsory education. Other students start in the second part of the basic program, so the duration of that program will be 20 weeks

- Minimum number of lessons per week while at school is 25, with better integration of school based and work placed learning, more individualized programs, and continuing training of trainers and school administrators
- Opportunities for dual qualifications (general upper secondary as well as a vocational upper secondary) plus more subjects at higher levels
- New adult apprenticeship programs
- Focus on guidance
- New vocationally oriented 10th grade
- New program for youth lacking the skills and competences to complete an upper secondary qualification

Ursula Scharnhorst from the Swiss Federal Institute for Vocational Education and Training (VET) discussed the Swiss system, generally considered among the world's finest. About 70 percent of Swiss youth choose the popular two-year VET track, the vast majority of the 90 percent students who complete upper secondary education. Of the 80,000 VET students, 70,000 will get apprenticeships and 10,000 school-based VET. The majority will go on to will continue to get a 3 or 4 year Federal VET Diploma and about two in five of those will eventually earn a tertiary Professional Education and Training degree (PET). The Swiss apprenticeship system consists of 3 to 4 days per week in the company, 3 to 8 weekly courses to deepen sector specific skills, and 1-2 days a week in a VET school to learn theory and general education.

B. Practices and Processes

Among the other administrators, practitioners, employers, and policymakers, the Symposium participants provided a range of perspectives on workplace learning, discussing innovations, practices, and analysis.

Kevin Jones, Vice President of the Austin Polytechnic Academy in Chicago described his school's atypical model. The Institute targets manufacturing at all levels—skilled technician, manager, and entrepreneur. It is deeply committed to equity, access, and community development and serves primarily a low-income urban population. The small selective school has over 60 industry partners and, although it does not offer a full-fledged workplace learning experience, students are heavily exposed to the workplace through tours, job shadowing, internships, summer jobs.

David Jones, Principal of Deeside College in Wales provided a perspective from the Further Education Sector in Wales. Employer sector groups specify and recognize the qualifications for work in various sectors but the engagement between most FE students and employers is less intense. Those who do enter into the formal Welsh apprenticeship job training program work out direct arrangements with their employers.

Henrik Pedersen, owner of an auto repair shop in the Copenhagen area, has trained more than 30 apprentices over the years. Currently he has three trained mechanics and three VET apprentices. Each apprentice follows an experienced mechanic for three months and then gradually assumes more responsibility and independent tasks while

rotating among other trained mechanics. Most Danish apprentices learn at small auto repair shops such as Mr. Pedersen's. The dual system is important to them because no small repair shop can afford to buy the specialized tools needed for all brands and models. Money is always an issue for small firms, and apprentices must be productive. A Danish apprentice's salary is half the level of a trained mechanic, so employers hope to be able to "bill" half of an apprentice's time to customers.

Rudi Pawlitschko teaches at a large VET institution in Bavaria, Germany. Germany has established regulatory frameworks for vocational training in participating companies, curriculum for VET school education, and an instruction plan with specific requirements of apprenticeship and company. The frameworks are determined by the National Institute for Vocational Education, business and industry chambers, companies, and VET institutions. Responsibility for learning is shared among company, chambers, and school with government approval. Each company must appoint a person responsible for training apprentices. Demand for apprentices in Germany and in Bavaria is high, and, as in Denmark, a worker shortage is projected. To recruit apprentices, a wide range of promotional events and advertising are utilized including providing internships for pupils at lower secondary school.

Henrik Fugmann, owner and manager of an electrical installation company in Copenhagen with 85 employees including 15 apprentices. The firm encourages apprentices to continue to higher level programs at Technical Academies or the Danish Technical University. Each year the company recruits four new apprentices, two from lower secondary school, one adult, and one with a different background. This creates a versatile and diverse workplace. Apprentices are viewed as equal to trained workers, with the goal of giving every person responsibility so that apprentices can learn and grow with each assignment. Getting qualified apprentices has not yet been a problem. The occupation is quite popular, attracting skilled applicants.

C. Discussion

Recruitment: The two Danish companies have not had a problem recruiting skilled apprentices. But the auto shops have seen a change in the background and profile of apprentices. Autos now are so technologically complex that firms need apprentices with stronger general education backgrounds to acquire the advanced skills. This includes students from the new EU programs that, in addition to vocational skills prepare students for higher education. This trend, however, leaves less academically oriented and more hands-on students with fewer training opportunities.

Responsibilities: In Denmark national trade committee and trade unions define the required skills and competences for various vocational programs. The VET institutions have primary responsibility, in close corporation with companies, for determining how targets are to be met and balance between learning in the company and in school. At the mid-point of the program the company and institution meet to develop an individual plan for the last part of the student's educational program.

Costs and benefits of training: The Danish employers both found that training of apprentices involves costs and benefits. The first two years of the training contract costs exceed benefits but as the apprentice progresses and works more independently, the

situation reverses. It is important for both companies and society to educate the workforce for the future and find room for apprentices in all companies.

III. Benefits

The advantages of experiential education, a portion of which occurs in the workplace, in the U.S. date back a century to John Dewey's educational theories and efforts to implement them. But the value depends heavily on the quality of the workplace setting, the experience, and the mentor-student relationship.

Learning by doing
The value of experiential, active learning is widely acknowledged. It provides an opportunity for students to acquire some of the tacit knowledge associated with work experience that is not learned from theory and textbooks or even school-based workspaces.

Immediate feedback
Students receive clear and immediate responses to their actions on the job, and the consequences are quickly evident, particularly as they affect downstream tasks.

Learn on latest equipment
Whereas educational institutions are often unable to afford to keep all their equipment current, the apprentice is exposed to the tools and technologies that are used by the employer and learns on that equipment, which is often state of the art.

Better matches supply of skills with and demand
Workplace learning improves the match between workforce demands and supply. Apprenticeship positions are direct expressions of employers' needs. The joint development of curricula by business, labor, and government increases the compatibility of training with the methods used by businesses but also ensures transferability across enterprises and sectors.

Connections to labor market
Workplace learning gives students an edge in future employment because they are known to employers and have been able to demonstrate their reliability, problem solving skills, and general value. As a result, many either remain with the companies in which they apprentice or can utilize recommendations when seeking employment.

Reduced youth unemployment and increased contributions to economy
Apprenticeship programs place youth into the labor market earlier and, in particular, gives youth who are experiential learners and may have dropped out of classroom-based programs a chance to contribute sooner to building a quality, skilled workforce.

IV. Limitations and Issues

Despite the acknowledged successes in Europe and the continuing interest in the U.S., changes taking place in the economy are creating new problems such as fewer positions and an increasing political emphasis on obtaining higher education credentials. The stumbling blocks in the U.S. have been around the questions of balance of responsibility between school and employer, mix of financial responsibilities, and the knowledge of programs and careers and their requirements and market value.

Shortage of employment opportunities
This has been a growing issue in Europe, where the competition is for fewer positions, which is causing more students to enroll in school-based simulated business settings. "The amount of apprenticeships and in-company training modules/placements offered by enterprises has experienced a remarkable downward trend in almost all analyzed Member States."[9] In the U.S., the issue is lack of funding and shortage of employers wiling to take on responsibility at their own cost.[10]

Early sorting and tracking of students
The dual track requires a decision on career tracks at an early age, often before youth are ready to make choices. Because the dual system allows less time for classroom learning, it lessens opportunities to continue on to higher education. Rebalancing the emphasis on theory and practice can address the opportunities for students to advance and provide opportunities for expanded apprenticeships and WBL offers a viable alternative for students.

Permeability
With increasing emphasis on and demand for higher education, the transferability of learning to higher education is becoming essential. It is common in the Swiss system (two in five) for VET completers to go on to a tertiary Professional Education and Training degree, and Germany now qualifies dual training for higher education.

Absence of social partners
The U.S. lacks the social partners structure of Europe, where business, labor, and government work together. Partnerships occur in the U.S. but generally are formed locally or regionally and typically do not include labor.

Parity of esteem
Vocational education has lower esteem than the college tracks in both the U.S. and in some of Europe. On average, its students come from lower socio-economic classes 9in the case of Germany, reflecting the historical social stratification of society). The problem is being exacerbated in the U.S. as more students are acquiring four-year credentials than the market requires, causing vocational students to compete with college graduates for jobs that require some degree of postsecondary education but less

[9] European Commission, *Apprenticeship supply in the Member States of the European Union*, Brussels: Directorate-General for Employment, Social Affairs and Inclusion, January 2012, p. 86.
[10] In Europe, numerous measures recently have been taken by companies and at the policy level to increase the number of apprenticeship places.

than a baccalaureate. In the EU, women are underrepresented in apprenticeship programs (30%)

Dropouts
Dropout rates are high and students can be tempted to leave before completing their learning to be assure of a job and salary.

Cheap labor for employers
Workplace learning can provide employers with low cost labor without the proper regulation and is sometimes designed around routine production rather than creating learning experiences. A recent survey of Apprenticeships in the UK showed that 10 percent worked for one supermarket chain.[11]

Over-specialization
With fewer students remaining with employers and even in careers as long as they once did, too much specialization restricts future options. Further, in the U.S., youth are changing jobs and careers much more frequently

At the same time, employers are increasingly asking for basic, "soft," and generic skills over highly specialized skills.

V. Recommendations for the US

The advantages of an education that emphasize workplace learning date back a century in the U.S., to John Dewey's recommended experiential and on-the-job learning. In 1937, the U.S. Congress enacted the National Apprenticeship Act for registered apprenticeship programs before the creation of a U.S. Department of Education, and the program has been administered by the Department of Labor ever since.

In 1983, the National Academy of Sciences suggested "mechanisms and incentives to encourage educators and employers to cooperate in planning, incentives for release time for teachers to work with industry, and tax incentives to firms to donate or allow schools to use their equipment" and "increased supervised work experience, including an expanded apprenticeship program."

Yet apprenticeships have never really become part and parcel of the American public educational system. And it appears highly unlikely that the United States will develop an apprenticeship program, at least not on the scale and with the support seen in some western European countries. The nation has a different educational, societal structure, and industrial culture, one that is based on individual state systems of education that go through 12 years of schooling, absence of free higher education, higher status among parents and students of classroom-based learning, and absence of a mentoring mentality in businesses. The U.S. also places an emphasis on "choice" even if a poor career navigation system leaves students uniformed or unprepared to enroll in specific fields or disciplines. Apprenticeships lack both the companies' investments in both education and workplace learning that are required in European programs and the

[11] "Keeping up with the Schmidts," *The Economist*, April 26, 2014.

necessary involvement or commitment of national sector-based business and labor organizations.

As a result of the internationalization of U.S. industry and the growing value placed on workplace learning in American education, it is increasingly becoming accepted and desired by employers and educators in the U.S. This is in part due to observed outcomes in countries like Denmark, Germany, and Switzerland, and in part to the desire of employers from those countries for apprenticeship programs in their U.S. operations.

Thus, the U.S. is likely to develop a form of apprenticeship, albeit an Americanized version. That most likely means a higher ratio of classroom to workplace time, greater investments on part of students, and its major thrust through community colleges, not secondary schools. For example, the President's Advanced Manufacturing Partnership members Dow, Alcoa, and Siemens and a coalition of employers are partnering with community colleges in Chicago, Minnesota, Northern California, and Southern Texas to develop scalable apprenticeship models in high-need advanced manufacturing. One coalition of community colleges and employers led by TA3 member South Central College in southern Minnesota is pioneering a statewide apprenticeship model in mechatronics.

Some ways to stimulate increased efforts include:

- Certifying/credentialing skills acquired through workplace learning to make them equal in value to classroom learning for transfer to higher education(including recognizing industry recognized credentials and "unregistered" apprenticeships)
- Increasing state investments in workplace learning with stipends for learners matched by employer and potential use of Federal Financial Aid
- Working with regional industry cluster or sector organizations to engage industry in the development of programs
- Assessing outcomes and comparing to similar employees with traditional education

VI. New Federal Initiatives in U.S. to Expand Apprenticeships

The current administration in the U.S. recently announced a $600 million investment in workplace education that includes $100 million to expand apprenticeship programs across the U.S. The apprenticeship grants will be aimed at fast-growing occupations and industries such as in information technology, high-tech services, healthcare, and advanced manufacturing, embedding industry-recognized skills certifications or reward workplace learning with college credit that will allow students to earn while they learn; and strengthen and invest in innovations and strategies to achieve scale. Over four years, this fund will provide competitive grants to partnerships of community colleges, industry and employers, to reform job training curricula and

launch new programs to deliver skills for in-demand jobs and careers. This fund will help to spur the development and adoption of common, industry-recognized credentials and skill assessments to allow employers to more easily identify and hire qualified candidates.

The Department of Labor is making $100 million in existing H-1B funds available for American Apprenticeship Grants to reward partnerships that help more workers participate in apprenticeships. The new American Apprenticeship Grants competition, which will be launched in the fall, will focus on partnerships between employers, labor organizations, training providers, community colleges, local and state governments, the workforce system, non-profits and faith-based organizations. These programs will create apprenticeship programs in new, high-growth fields, align apprenticeships to pathways for further learning and career advancement and apprenticeships that embed industry-recognized skills certifications or reward workplace learning with college credit.

The program will also scale existing successful apprenticeships that already exist. The Departments of Labor, Education, and Veteran Affairs will also reform their programs to enable the use of education benefits for apprenticeships including streamlining GI Bill benefits for apprentices and connecting apprentices with college credit. The Registered Apprenticeship College Consortium (RACC), a partnership to date of 33 community colleges and systems along with national accreditors, employers, and major apprenticeship sponsors to provide apprenticeship graduates with credits that will transfer to any community college in the consortium.

A proposed request by the Obama administration would establish a $2 billion Apprenticeship Training Fund that would provide grants for comprehensive expansion strategies that can combine small incentives and guidance to employers with a statewide marketing effort to drive apprenticeship adoption as well as innovative regional consortia to create new apprenticeships and increase participation in existing apprenticeship programs. With support for comprehensive state strategies and regional innovations from Congress, these efforts could double the number of U.S. Registered Apprenticeships within five years.

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