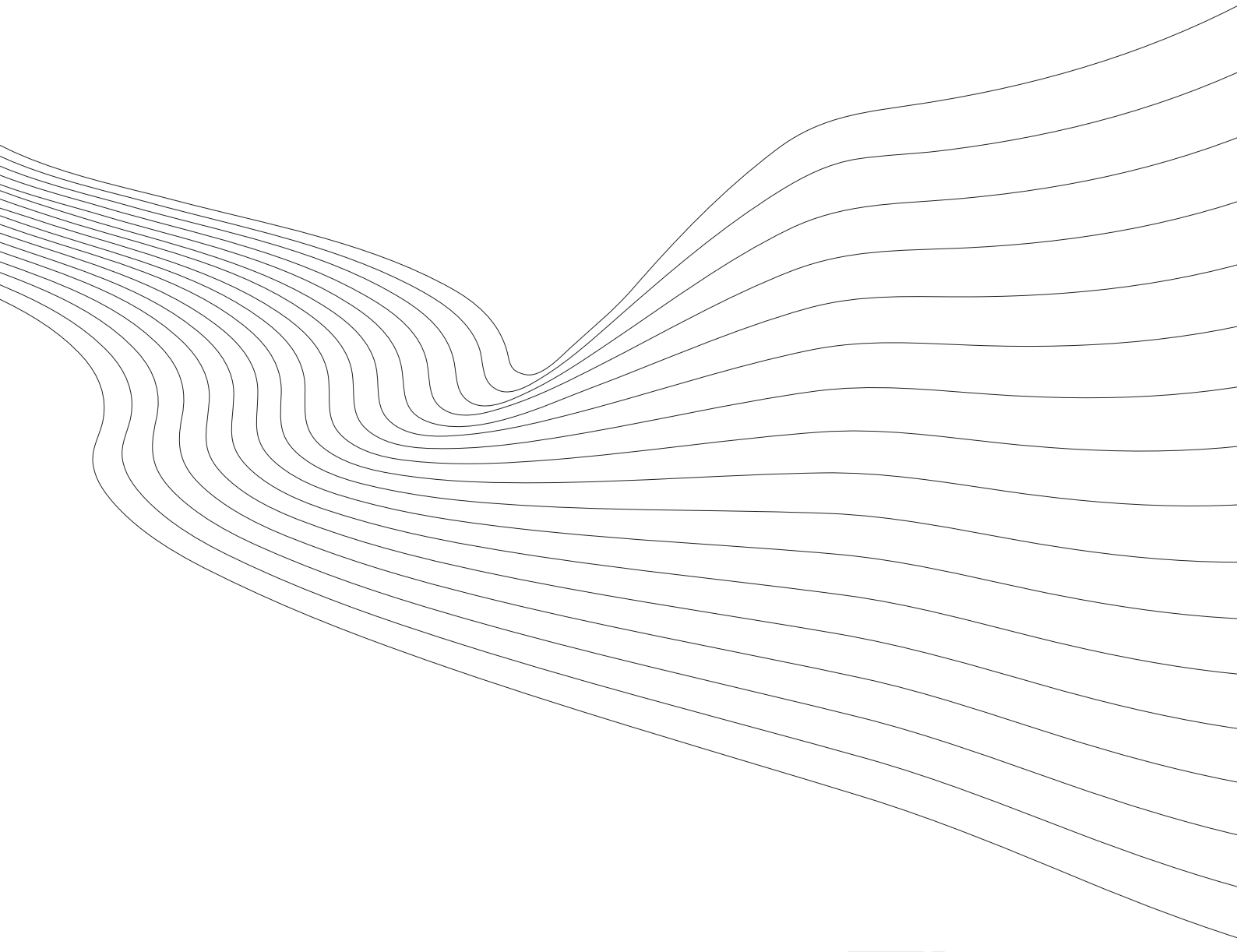
KOF

KOF Factbook Education System United States of America



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List of Abbreviations

CCTC	Common Career Technical Core
CPT	College Placement Test
CTE	Career and Technical Education
ECE	Early Childhood Education
ESEA	Elementary and Secondary Education Act
FDI	Foreign direct investment
FRED	Federal Reserve Economic Data
GCI	Global Competitiveness Index
GDP	Gross Domestic Product
GED	General Educational Development Test
GII	Global Innovation Index
IMF	International Monetary Fund
ISCED	International Standard Classification of Education
KOF	Swiss Economic Institute
LAACs	Local Area Apprenticeship Committees
LFPR	Labour force participation rates
NASDCTEc	Nat. Association of State Directors of Career Technical Education Consortium
NCES	National Centre of Education Statistics
NLCB	No Child Left Behind Act
OA	Federal Office of Apprenticeship
OECD	Organisation for Economic Co-operation and Development
OVAE	Office of Vocational and Adult Education
Pre-K	Pre-Kindergarten
RA	Registered Apprenticeship
SAT	Scholastic Achievement Test
SSA	State Apprenticeship Agency
TAA	Trade Adjustment Assistance
UIS	UNESCO Institute for Statistics
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNEVOC	International Centre for Technical and Vocational Education and Training
USDOL	Office of Apprenticeship within the Department of Labor
VE	Vocational Education
VET	Vocational Education and Training
VPET	Vocational Professional Education and Training
WEF	World Economic Forum
WIA	Workforce Investment Act
WIB	Workforce Investment Board
YLMI	Youth Labour Market Index

FOREWORD

In the last years, vocational education and training has received more and more attention. The increased pressure to upgrade the skills of the workforce through an increasingly competitive world economy, or the high youth unemployment rates in the aftermath of the world economic crises putting pressure on politicians to provide solutions could be part of the reason why. In fact, vocational education has been suggested as one major solution to these problems since it provides an education pathway for those who do not continue with tertiary level education and helps upgrading the skills of those who would have started working immediately and would have received some form of on-the-job training.

The increased attention for vocational education and training was in particular perceptible among policy makers. In Europe, the European Commission defined common objectives for the further development of the vocational education and training systems of the European countries for 2020 and an action plan for the upcoming years in the *Bruges Communiqué on enhanced European cooperation in vocational education and training for 2011-2020* (European Commission, 2010). In the United States, Obama mentioned in a speech that he wanted to increase the investment in vocational education and training system of the United States of America (The White House, 2015). But also many other countries worldwide, such as South Korea or Hong Kong, show increased interest in extending their vocational education system.

Worldwide, only a few countries have a well-elaborated and efficient vocational and professional education and training (VPET) system, among these the Swiss VPET system. It is a good example of how an education system can contribute to the successful matching between market demand and supply. It is highly efficient in getting the adolescents into the labour market (7.7% from 2005-2012, compared to the OECD average of 14.6%, OECD, 2015).

Though not many countries have VPET system that is comparable to Switzerland, many have a vocational component in their education system. To provide information about the education systems of other countries, with a special focus on the part of the education system teaching vocational skills, is the major purpose of the KOF Factbooks Education System.

SUMMARY

In the KOF Factbook Education System United States of America, we will describe the vocational system of the US in general and in particular refer to factors which are crucial for the functioning of the system. Among others, these comprise the regulatory framework and the governance of the VPET system, specifying the actors that are involved and which competencies and duties they have. Further, the curriculum development and the actors involved in this process, as well as the financing of the system, etc.

The Factbook is structured as follows. We will refer to the US economy, the labour market, and the political system in the first part of this Factbook. The second part is dedicated to the description of the entire formal education system. The vocational part of the education system in the US will be explained in the third part. And finally, the last section gives a perspective about the set of reforms of the US education system went through in the past and will face in the future.

EDITING AND ACKNOWLEDGEMENTS

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The KOF Factbook Education System series has to be regarded as work in progress. The authors do not claim completeness of the information which has been collected carefully and in all conscience. Any suggestions for improvement are highly welcome!

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1 The Economy of the United States of America and its Political System

One of the main purposes of an education system is to provide the future workforce with the skills needed in the labour market. The particularities of a country's economy and labour market are important factors determining the current and future demand for skills. Therefore, they will briefly be described in the first part of this Factbook. In addition, this part provides an overview of the political system in the US with emphasis on the description of the education politics.

1.1 The US Economy

The United States (US) is solidly anchored among the developed economies by most standards. As a founding member of the OECD it ranked 4th out of the 34 members with respect to GDP per capita in purchasing power parity (PPP) at USD 52 985, behind Luxembourg, Norway and Switzerland in 2013 (OECD, 2015a).

Over the 1994-2013 period, the US economy grew in real terms at an average pace of 2.5% per annum (p.a.) outperforming the OECD as a whole[1], as well as the UK whose averages were both of 2.2% p.a. That performance was in big part due to a decade of stronger growth in the 1990s.

The US ranks at the 34th place of the 2015 KOF Index of Globalisation[2] (value of 74.8 for 2012, KOF 2015a). Although the US is the biggest trading nation when measured in current USD, the very large internal market of the US has enabled a lower reliance on international trade proportionally to GDP. Trade (as defined by imports plus exports) added up to only 30% of GDP in 2013 (World Bank, 2015b), the 4th lowest percentage behind Sudan, Brazil and Argentina, while the other extreme is composed of small open economies such as Singapore, Luxembourg or Hong Kong, which, in the latter case, traded as much as 455% of GDP. In fact, the US trade has been characterized by a structural and swelling deficit (larger imports than exports) since the mid-1970s resulting in the most negative trade balances among developed economies (FRED, 2015 and World Bank, 2015a).

[1] Recall for all of the following comparisons that the US economy adds up to roughly a third of the size of all remaining OECD countries together, thus the US significantly impacts the results of the latter on its own direction.

[2] The KOF Index of Globalisation measures the economic, social and political dimensions of globalisation. Here, we focus on the economic dimension of globalisation, the KOF Index of Economic Globalisation. It is constructed by using indicators for long distance flows of goods, capital and services (that is, data on trade, foreign direct investment (FDI), and portfolio investment), as well as information and perceptions that accompany market exchanges (restrictions to trade and capital, using hidden import barriers, mean tariff rates, taxes on international trade and an index of capital controls).

The fiscal position of the US has deteriorated since the early 2000s: the general government debt-to-GDP ratio has increased from 53% in 2001 to 103.4% in 2013, and although public finances have been consolidated since the 2008 crisis, they still suffered a deficit of -5.8% of GDP in 2013, which corresponds to roughly a 6th of total public spending. That deficit figure is on par with the UK and Ireland (-5.7%), and among developed economies, only Slovenia (-13.8%), Japan (-8.5%) and Spain (-6.8%) submitted worse fiscal exercises (IMF, 2015). Inequality is particularly relevant in the context of the US economy and the subject of hot debates within academic and political spheres for some years. In fact, the US experiences the fourth worst income disparity among OECD members as measured by the Gini coefficient[3], which increased from 0.38 to 0.40 (higher income inequality) in the US between 2007 and 2013. Therewith, US inequality was significantly higher than in the OECD countries on average of 0.32 in 2012 (OECD, 2015b).

Table 1: Share of employment and value added per sector, 2012

Sector	USA: Value added (%)	EU-28: Value added (%)	USA: Employment (%)	EU-28: Employment (%)
Primary sector	1.2	1.7	1.5	5.0
Agriculture, hunting and forestry, fishing	1.2	1.7	1.5	5.0
Secondary sector	21.0	24.8	18.3	22.0
Manufacturing, mining and quarrying and other industrial activities	17.2	19.3	12.1	15.6
of which: Manufacturing	13.0	15.4	10.2	14.0
Construction	3.8	5.5	6.2	6.4
Tertiary sector	77.7	73.6	80.1	72.9
Wholesale and retail trade, repairs; hotels & restaurants; transport; information and communication	22.0	23.9	28.6	27.4
Financial intermediation; real estate, renting & business activities	29.8	26.9	16.3	15.8
Public administration, defense, education, health, and other service activities	25.9	22.8	35.2	29.7

Source: OECD (2014 and 2015c) for the USA; Eurostat (2015a,b) for EU-28.

Being one of the most developed economies in the world, it is no surprise that the structure of the US economy is heavily skewed towards services. In fact, the US service sector accounted for roughly 80% of total employment and overall value added of the US economy in 2012 (Table 1). Compared to 72.9% for the EU-28 countries this is a rather high value. Within the tertiary sector, the wholesale and retail trade sector employed most people (14.1% of total employment), followed by the professional and business services (12.3%), state and local

[3] The Gini coefficient measures the differences in the income distribution (in some cases the consumption expenditure) of individuals or households. A coefficient of '0' means equal distribution of income. '100' corresponds to complete inequality where one individual or household possesses the total income (World Bank, 2015b).

government (13.1%), health care and social assistance (11.7%) and leisure and the hospitality sector (9.5%).

The primary sector accounted for only 1.5% of total employment and 1.2% of the overall value added in 2012. However, these shares indicate a higher labour productivity in this sector compared to the EU-28 countries, where 1.7% value added are generated by 5% of total employment. Finally, the secondary sector provided for about 1/5th of total employment (18.3%). The sector totalized 21.0% of overall value added in 2012.

According to the Global Competitiveness Index (GCI) of the World Economic Forum (WEF), the US economy is part of the *innovation-driven* economies, which the WEF defines as the most advanced economic development a country can achieve. In the 2014/2015 ranking, the US ranks 3rd out of the 144 countries, right after Switzerland and Singapore. It has strengthen its position over the past three years, when it hovered between the 5th and 7th spots (WEF, 2014).

Regarding its innovativeness, the US economy belongs to the most innovative countries in the world. According to the Global Innovation Index (GII), an index that is co-published by the Cornell University, INSEAD and the United Nations, the US economy ranks at the 6th place (60.1 points) behind Switzerland, the United Kingdom, Sweden, Finland and the Netherlands (Dutta et al., 2014).

1.2 The Labour Market

1.2.1 Overview of the US Labour Market

The highly flexible US labour market slightly outperforms that of the OECD average with regard to the labour force participation rates (LFPR) and unemployment rates. In 2013, the US LFPR of those aged 15-64 was with 72.8% slightly above the OECD average of 71.1% (Table 2). And the US unemployment rate was with 7.5% somewhat lower than that of the OECD average of 8.1% in 2013.

Table 2: Labour force participation and unemployment rate per age and gender (2013, in %)

	Labour force participation		Unemployment rate	
	US	OECD average	US	OECD average
Total (15-64 years)	72.8	71.1	7.5	8.1
Youth (15-24 years)	55.0	47.3	15.5	16.2
Women (15-64 years)	67.2	62.6	7.2	8.1

Source: OECD (2015d).

Just as the OECD, the US depicted a lower LFPR for women. Thereby, the difference between the overall LFPR and that for women was lower for the US than for the OECD average. The

US unemployment rate for women was also slightly higher than the aggregate. Not surprisingly, the LFPR for the youth (15-24 years) was lower than for the entire working population, equally in the US and the OECD average. The youth had also a higher risk of becoming unemployed.

Labour force participation in the US is positively correlated with the education level: the more educated people in the age between 25 and 64 years are more likely to participate in the labour market (Table 3). For unemployment the story is reversed: the people with less than upper secondary education have triple the unemployment of that of people educated at the tertiary level. The OECD average follows the same trends.

Table 3: Labour force participation and unemployment rate per education (2013, in %)

	Labour force participation		Unemployment rate	
	US	**OECD average**	**US**	**OECD average**
Less than upper secondary (25-64 years)	60.9	63.2	12.7	13.5
Upper secondary (25-64 years)	73.8	79.6	8.2	8.0
Tertiary (25-64 years)	83.8	87.6	4.1	5.3

Source: OECD (2015e).

If compared to the OECD average, the people aged 25-64 in the US depicted a slightly lower LFPR (81% versus 81.5%, OECD, 2015f), but also a lower unemployment rate (6.3% for the US, 7.3% for the OECD average) in 2013 (Table 3). The same holds for a decomposition of the LFPR according to the education level. Considering that the LFPR of the OECD average for the 15-64 years old is higher than the US equivalent, and that the LFPR of the youth (15-24 years) is higher in the US, one possible conclusion is that the youth in the US enters the labour market earlier than in the average OECD country.

1.2.2 The Youth Labour Market

To compare the labour market situation of adolescent across countries, the KOF Swiss Economic Institute developed the KOF Youth Labour Market Index (KOF YLMI) (Renold et al., 2014). The basic idea behind this index is that a single indicator, such as the unemployment rate, does not suffice to describe the youth labour market adequately and to provide enough information for a comprehensive cross-country analysis. To improve the information content of such an analysis and to foster a multi-dimensional approach, the index consists of twelve labour market indicators[4], which are summarized in four categories.

The first category describes the *activity state* of the young, specifically of those between 15-24 years old, on the labour market. Therein, the adolescents are classified according to

[4]The data for these indicators are collected from different international institutions and cover up to 178 countries for the time period between 1991 and 2012.

whether they are employed, in education or neither of both (unemployed, discouraged and neither in employment nor in education or training, see info box to the right). The category *working conditions* and the corresponding indicators reflect the kind and the quality of jobs of the working youth. The *education* category accounts for the share of adolescents in education and training and for the relevance of and need for their skills on the labour market. The fourth category, *transition smoothness*, shall connect the other three categories by capturing the school-to-work transition phase of the youth. Each indicator of the KOF YLMI ranges from 1 to 7. Thereby, a higher score reflects a more favourable situation on the youth labour market and a more efficient integration of the youth in the labour market.

Dimensions of the KOF YLMI
Activity state - Unemployment rate - Relaxed unemployment rate[5] - Neither in employment nor in education or training rate (NEET rate)
Working conditions Rate of adolescents: - with a temporary contract - in involuntary part-time work - in jobs with atypical working hours - in work at risk of poverty[6] Vulnerable unemployment rate[7]
Education - Rate of adolescents in formal education and training - Skills mismatch rate
Transition smoothness - Relative unemployment ratio[8] - Long-term unemployment rate[9]
Source: Renold et al. (2014).

One major drawback of the KOF YLMI is the data availability. Often, a category is based on a single indicator or no indicator for that category exists at all. This could make comparisons across countries or groups of countries problematic or even impossible.

The US and the KOF Youth Labour Market Index

For the US, only a few indicators are available. The KOF YLMI is limited to four indicators, namely *unemployment rate*, *involuntary part-time worker rate*, which reflects the proportion of young people that is working part-time and that would work full-time if they had the opportunity to, *relative unemployment ratio*, which measures the unemployment differential between young and adult unemployment rates to capture the transition smoothness of the youth into the labour market, and *incidence of long-term unemployment rate*, which computes the share of young people that were unemployed for more than a year among the totality of unemployed young

[5]It is calculated as the number of unemployed and discouraged workers as a share of the entire labour force. Discouraged workers have given up the search for work (not actively seeking), although they have nor job and are currently available for work (also: "involuntary inactive").

[6]Those who cannot make a decent living out their earnings, being at risk of poverty as a percentage of the working population.

[7]Share of the employed population working on their own account or those working in their family business and thus contributing to the entire family income. Both are less likely to have formal work arrangements and are therefore less protected by labour laws and more exposed to economic risk.

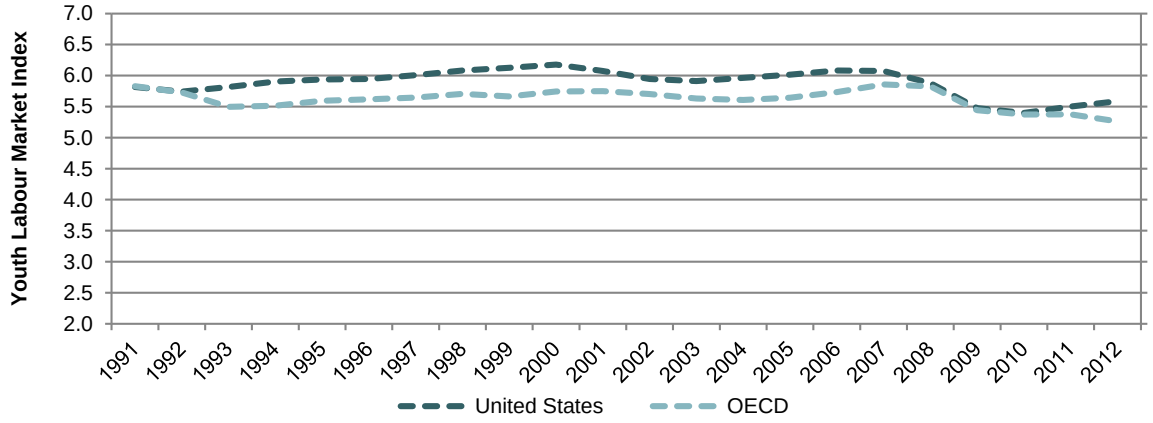
[8]Is defined as the youth unemployment rate (15-24 years) as a share of the adult unemployment rate (25+). If the youth cohort is affected in the same way than the adult group with respect to unemployment, then the relative unemployment ratio will be equal to one. If the youth are relatively more affected, then the ratio will be bigger than one.

[9] Those unemployed for more than one year (52 weeks) in the total number of unemployed (according to the ILO definition).

people. To make the KOF YLMI for the US comparable, the index for the OECD average was reduced to the same set of four indicators.

Figure 1 shows the aggregate score of the KOF YLMI for the time period 1991-2012. The US was put in perspective with the OECD average. The aggregation shows that the US constantly outperformed the OECD average over the entire time period. The US outperformed the OECD in all four indicators but the *relative unemployment ratio* since 1998. This means the differential between youth and adult unemployment was bigger in the US than in the OECD – but they both stood at a lower level; and it has done so for all four indicators since 2008.

Figure 1: Aggregated score of the KOF YLMI, US versus OECD average, 1991-2012



Source: KOF (2015b)

1.3 The Political System

The political system of the United States of America is a presidential system, where the president leads the government and is the head of state. The president of the USA has a powerful position and can influence politics to a large extent. Nevertheless, he is also restricted in his power by a system of *checks and balances*. The president shares the power with an independent parliament (congress & senate), an influential judiciary, and with the federal states possessing extensive responsibilities. Although the position of the president and parliament are strictly separated, both institutions are fully dependent from each other: the president has a veto-right on the legislation, since he has to sign every bill passed by the parliament. However, the congress and the senate can override the veto by a two-thirds majority in each house. Since the introduction of the *Budget and Accounting Act,* the president needs to provide an overall budget for the whole administration. Thereby, the president has an important role in the legislation process, since he yields the central political projects of his administration through intermediaries. As a result, the president is also called the chief legislator. However, the president is also dependent on the parliament since he needs a majority for his proposed bills. If the president has no majority in the parliament (from the same party), the situation is

called *divided government*. Since the country has a majority voting system, which promotes the establishment of only two parties. As a consequence, the president has no possibility to make a coalition with another party, as the other party is always the opposition (Stüwe, 2008).

The legislative is a typical case of a working parliament, i.e. the standing committees debate the legislative proposals, but hardly in the political arena. Furthermore, the parliament has to initiate all legislation bills, although the president has a high influence on them. In doing so, the policy of foreign affairs takes an important role. The congress has to ratify every single international treaty by a two thirds majority which the government has negotiated. In addition, the control of the government is another important task (Stüwe, 2008).

In addition, Federalism shapes the political system of the US. In total, there are 50 states which represent the second level in the political and administrative system of the country. According to the constitution of the United States of America, the states have legislative competences (*enumerated powers*). Every competence that is not assigned to the federal state falls in the sphere of competence of the states (i.e. regulations, public law etc.). Compared to other federal systems, each federal state of the USA is quite powerful. However, the states are not allowed to pass a bill which conflicts the constitution of the US (Stüwe, 2008).

Politics and Goals of the Education System

Due to the federal organisation of the country, the states are also responsible for the educational system. Moreover, a considerably large network of private educational organisations exists next to the public schools. As a consequence, there is a huge variety of regulations within the United States. The Department of Education defines an overall body of rules and regulations for the schools. However, most decisions take place at the local level of the school districts. At this level, the local Boards of Education define educational guidelines for the district, as well as the rate of school taxes. In addition, they have the response to maintain the schools. As a matter of fact, regional characteristics influence the curriculum. An exception of the local influence is the working accreditation for teachers and schools: in order to get a certification, the permission of the state is required (Council on Foreign Relations, 2013; U.S. Department of Education, 2008a).

In the last 30 years, the U.S. education system lost its international competitiveness. Compared to other countries, the United States have an especially low pre-school enrolment rate, as well as a high college dropout rate. According to the Council on Foreign Relations (2013), the greatest competitive weakness is the deep and growing achievement gap between socioeconomic groups. The differences between socioeconomic groups start already in early ages and last through a student's entire academic career.

The current government has initiated several reforms for the education system. Obama made a commitment in 2009 that the country will once again have the highest proportion of tertiary graduates in the world by 2020. In doing so, he initialized the K-12 education initiatives which are refocusing reform effort on the most disadvantaged and worst performing schools, as well as to improve the quality of education in total (ibid.).

K-12 is the term for the number of years spent in primary and secondary education that is free for all students. In 2001, the Bush administration started the *No Child Left Behind* (NCLB) program.[10] The main goal was to not influence the curriculum, but to shape the direction of educational policy beyond expanding access for all. In doing so, the NCLB cast the accountability net wider to include all students, regardless of income or other factors. The Obama administration, with its K-12 initiative, continued the broad commitment to accountability, since the program has ensured some basic level of quality while controlling costs. In contrast to the former program, the administration focuses on better measurements for education quality and a more efficient use/spending of resources for the worst-performing schools. In doing so, the efforts were centered on four pillars: improving teacher evaluation, expanding high-quality schools, encouraging states to adopt standards, and developing data systems to track student performance (Council on Foreign Relations, 2013).

2 Formal System of Education

Each state can decide independently about the entry age for compulsory education. In general, compulsory schooling starts somewhere between the age of 5 to 8 years and ends somewhere between the age of 16 and 18 years. Compulsory schooling is typically divided into three levels: elementary school, middle or junior high school and high school. Each of this stages will be described in the following. Figure 2 shows an overview of the education system of the United States where all types of schools are mentioned.

2.1 Pre-Primary Education

Pre-primary or *early childhood education* (ECE) in the United States is organized in a federal way. This means that its organization and the obligation to attend varies from state to state. Commonly named as *nursery school* or *pre-kindergarten* (pre-K), any form of preschool and ECE programs normally lasts until the age of 6 where pupils enter primary education. The

[10] No Child Left Behind (NCLB) Act of 2001, Pub. L. No. 107-110, § 115, Stat. 1425 (2002).

typical entry age for early childhood education is with the age of 4, but varies among the different educational services and institutions. This is reflected in the enrollment rates of 2011, which show that only 50% of all children at the age of 3 were enrolled in pre-primary education institutions, whereas this rate was with 78% higher when considering pupils aged 4. (OECD, 2013:285 et seq.). However, compared to the other OECD countries, the enrollment rate of 4-year-olds in the United States was relatively low (OECD-average: 85%). Even if this rate has been steadily increasing over the last decades (OECD, 2013: 285 et seq.).

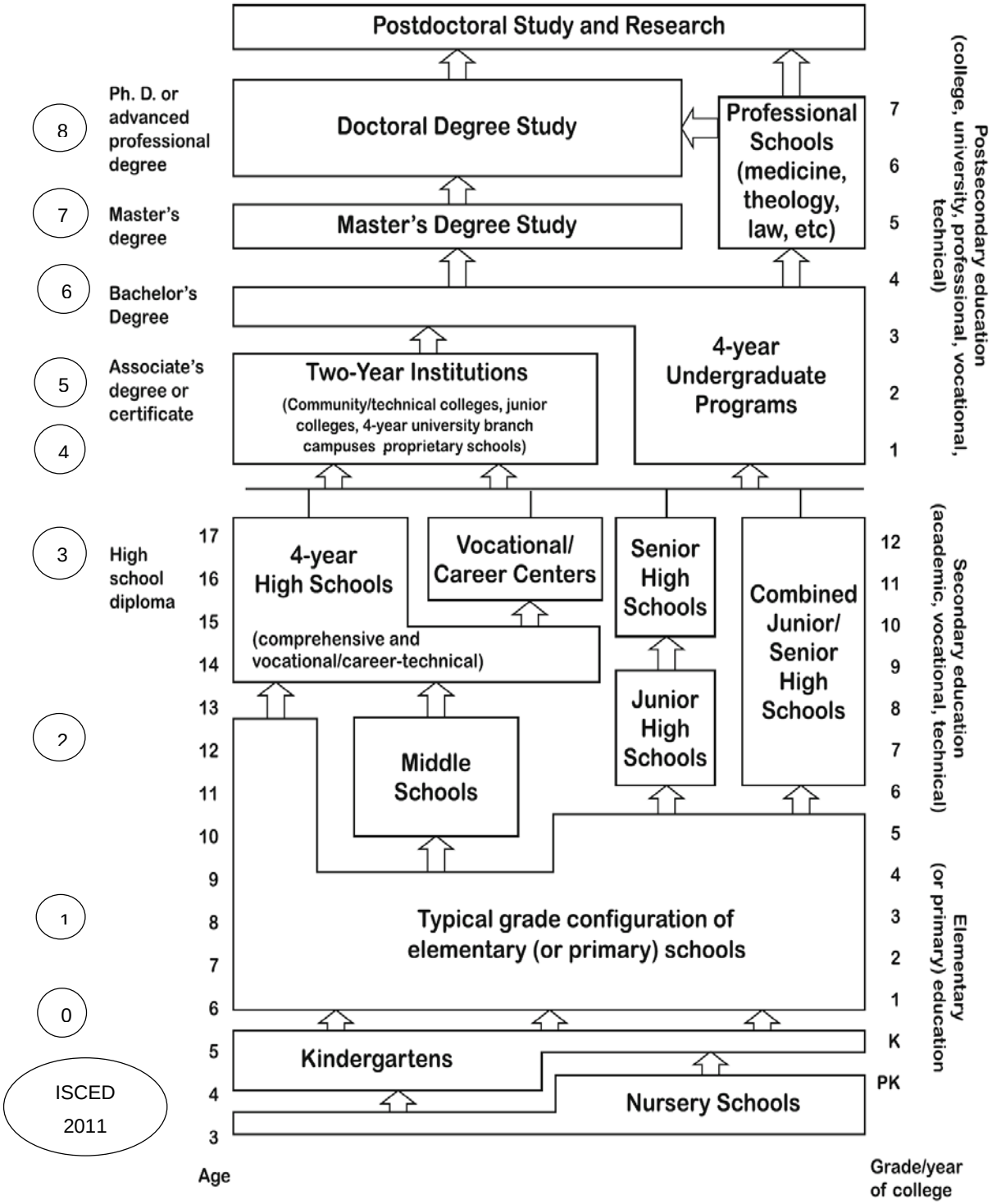
Regarding the *International Standard Classification of Education* (UIS, 2012), all forms of preschool education in the United States are counted as ISCED level 0. Early childhood education programs often combine educational objectives and childcare, hence, no sharp distinction based on the programs' content can be made. These so called *integrated programs* (OECD, 2013: 280) are provided by state as well as by private funded institutions. In the US, a share of 55.2% of all pupils at ISCED level 0 attended public programs whereas a minority of 44.8% took part in private programs in 2011. Regarding the expenditure for educational institutions, 70.9% of the total budget come from public sources whereas 29.1% was from private sources in 2011 (OECD, 2013: 285 et seq.).

Education in kindergartens is sometimes counted as part of *pre-primary education* and sometimes as part of *primary education*. This is often depending on whether the respective state made kindergarten attendance compulsory or not. Attendance is compulsory in only 15 states, whereas in 35 it is not (Snyder and Dillow, 2013:254). Whenever it is compulsory, kindergarten is often embedded in *elementary school* which is part of primary education.

2.2 Primary Education

Primary education often coincides with the beginning of compulsory education which starts in half of the states at the age of 6 whereas in 8 states pupils are required to attend school one year earlier. In 15 states compulsory school attendance starts at the age of 7, whereas the beginning of formal education starts at the age of 8 in only two states (Snyder and Dillow, 2013:254). Typically, schools for primary education are *elementary* or *grade schools* which last for 6 years up to the age of 11. Besides 6-grade elementary schools, there are 8-grade schools which integrate lower secondary education, these encompass ISCED level 1 and 2 (see Figure 2).

Figure 2: The structure of the education system in the United States



Note: Adapted from NCES (2015).

Primary education institutions can be divided into public and private schools, whereas private schools are either government dependent or totally independent. However only about 10% of all pupils are enrolled in private schools whereas the vast majority attend public schools. Primary schools provide fundamental skills in reading, writing and mathematics and social studies like history and geography. Furthermore, crafts, music and art as well as physical education are taught. Foreign languages, which are used to be matter of secondary education, are partly introduced in the last years of primary education. (Snyder and Dillow, 2013).

2.3 Secondary Education

As in many other countries, the U.S. education system differs between lower and upper secondary education. After the fifth or sixth grade of elementary schools, pupils can change to a 3-year *middle schoo*l or to a *junior high school* which may range from sixth up to the ninth grade. Accordingly, upper secondary education is denoted as *senior high school* or simply a *4-year-high school* usually following a middle school. In both cases, school attendance lasts until the twelfth grade, which is the highest level of formal education (also known as K-12 system).

However, the legal school leaving age depends on the respective state's age range for compulsory school attendance and varies between the ages of 16 and 18. Figure 2 shows an overview of the education system of the United States where these types of schools are mentioned.

Students who graduate from high school usually receive a high school diploma which allows them to enter postsecondary education. Besides the high school diploma, the General Educational Development Test (GED), the Scholastic Achievement Test (SAT) and the College Placement Test (CPT) are also import degrees regarding higher education entrance qualification. These tests are considered equivalent to the standard GED.

Reflecting the flip side, the status dropout rate of high schools can be used to summarize the enrolment rate. It indicates that in 2012, approximately 7 percent of the 16- through 24-year-olds were not enrolled in high schools and did not earn any high school credentials (Snyder and Dillow, 2013:61 et seq.). Even though it had been decreasing over the last decades, the dropout rate varies by race/ethnicity. While among whites students the dropout rate is about 4%, it amounted to 13% among Hispanics in 2012. In general, high school dropouts are not unproblematic since they can result in undesirable outcomes, such as a higher unemployment rate and (hence) a lower income (Aud and Fox, 2010:94 et seq.; Heckman and LaFontaine, 2010:2).

Regarding the ISCED levels, secondary education is typically categorized as level 2 (lower secondary) and level 3 (upper secondary) education. The former is characterized by a transition to more subject-oriented instruction, whereas the latter is usually the final stage of general education. In this stage, students can specialize in courses leading to college entrance or concentrate on career and technical courses (see Chapter 3), leading to a more vocationally oriented track (Zirkle, 2012: 34). Moreover, optional courses allow students to gain *postsecondary* career and technical education (CTE) credits in high schools which is fairly popular among students (Zirkle, 2012: 34). However, the program contents vary from state to state and school to school since no binding nationwide curriculum exist.

2.4 Postsecondary and Higher Education

Postsecondary education in the US involves a vast scope of diverse institutions and programs, ranging from standard university degree programs to more job-specific training programs. In general, one can distinguish between institutions participating in the federal financial student aid program (i.e. title IV intuitions) and institutions which are not registered in this program and therefore do not show up in federal statistics. Normally, the latter are often *non-degree-granting*, for-profit institutions, providing less than 2-year professional teaching courses that do not lead to any degree or certificate (Kuczera and Field, 2013:49). Nevertheless, in terms of numbers and characteristic figures, relatively less is known about these non-authorized institutions.

There are approximately about 7,000 postsecondary institutions which are eligible for receiving federal student aid. These institutions can be characterized by their level of attendance (4-year, 2-year, less-than-2-year) and/or by their status (public, private non-profit, private for-profit). The main characterization of private institutions is their independency of state control even though they are authorized and licensed by state governments. Public as well as private institutions might ask students for tuition fees and receive money from donations and gifts.

Typically, postsecondary institutions are divided into four categories, representing the entire spectrum of these educational services.

- In the school year 2010/11, the largest share of undergraduates (44%) was enrolled at the 2-year public institutions, commonly named as *community colleges*. These institutions either award *associate's degrees* in vocational fields which are strongly job-orientated or lead to *academic associate's degrees*, mainly preparing students to proceed to four-year institutions. Other programs, like language or recreational courses, show the broad offer of the community colleges which are very often attended part-time (Eckel and King, 2004:1).

The extension and meaning of vocational training in community colleges will be discussed in Section 3.3.1.

- Public 4-year institutions comprise colleges and universities offering comprehensive undergraduate and graduate teaching as well as preparation in professional fields. They often attributed "*senior*" in order to distinguish them from "*junior*" institutions which offer the associate's degree as their highest credential. However, there are senior colleges and universities offering the entire range of degrees. The bachelor degree is normally awarded after a 4-year course whereupon a 2-year master degree might follow. Doctorate degrees are 4-year post-baccalaureate degrees and strongly research orientated. Besides graduate schools, professional schools, most common in the field of law and medicine, are also institutions of higher education lasting 4-6 years and prepare students for professional practice (NCES, 2013.2).

- Private not-for-profit institutions are fairly diverse ranging from research universities to four-year liberal art colleges to faith-based institutions and schools, which are specialized in specific fields (e.g. nursing schools). Hence, they cover the entire scope of 2-year and 4-year institutions.

- Private for-profit institutions primarily provide vocational education where high school graduates can earn some sort of certificates rather than degrees in 2-year or less-than-2-year institutions.

Table 4: Undergraduate enrolment in Title IV institutions in 2010-2011

Duration	Total (%)	Public (%)	Private, non-profit (%)	Private, for-profit (%)
4-year	50	30	12	8
2-year	47	44	<1	3
less-than-2-year	3	<1	<1	2
Total (25'095'038)	**100**	**74**	**13**	**13**

Source: NCES (2011).

The largest share of postsecondary students, almost three-quarters, is enrolled in public schools whereas private non-profit and private for-profit institutions have approximately the same enrolment rates (Table 4). Less-than-2-year institutions only count for a very small share of students (2%) whereas most of these are private for-profit ones (see Table 5).

Table 5: Title IV undergraduate institutions in 2010-2011

Duration	Total (%)	Public (%)	Private, non-profit (%)	Private, for-profit (%)
4-year	41	10	22	9
2-year	33	15	2	15
less -than-2-year	26	3	1	22
Total (6'973)	**100**	**28**	**26**	**46**

Source: NCES (2011).

Regarding the ISCED levels, most postsecondary education starts at level 5. Typically, 2-year vocational and academic education as well as education in a 4-year institution are referred to *tertiary* or *higher education*. Postsecondary education programs that are not labeled as tertiary education are classified as ISCED 4, meaning that in such institutions students get prepared for labor market entry (vocationally orientated) or for tertiary education. This category comprises courses that last for less than 2 years, and those providing 2-year vocational training with rather lower requirements.

3 The System of Vocational Education and Training

The vocational*/career and technical education* (CTE) system in the United States is broad and fairly complex. The US term *career and technical education* was first introduced by the Perkins Act[11] and is now used interchangeably with the term *vocational education and training (VET)*. The term is used for different grade levels and institutions and for various subjects. As such, CTE does not only encompass postsecondary education, it also includes secondary as well as adult education.

In contrast to upper secondary VET programs with a work-based component, as for example in Switzerland, CTE in high schools does not always aim to make students ready for entering the labour market directly but may comprise CTE courses to explore different career fields or serve as preparation for the labor market as part of their general high school diploma.

This chapter attempts to shed a light on this multifarious CTE / VET system by describing the common core characteristics and the federal influence by looking at the different funding streams at the national level, as well as the regulatory and governance of the system.

[11] Carl D. Perkins Career and Technical Education Improvement Act of 2006, Pub.L. No. 109-270, § 120 Stat. 684.

3.1 Background

For over a century, the United States led the world in equipping its young people with education they would need to succeed in the labour market. Nowadays, there are troubling signs that the US is failing to prepare millions of young adults for educational and professional success.

In fact, there is growing evidence of a “skills gap” in the US, meaning that many young adults lack the skills and work ethic needed for many jobs that pay middle-class wages (Symonds et al. 2011:3 et seq.). Therefore, the US faces a growing demand for midlevel professional qualifications. Until 2018, almost two thirds of all job vacancies will require more than high school education, but only half of these will require four-year degrees or higher qualifications (Carnevale et al., 2010:13 et seq.). This means that nearly one third of the vacancies will require some postsecondary qualification but less than a four-year degree, namely an associate degree, certificate or certification (Kuczera and Field, 2013:17).

In 2009, President Obama addressed this problem by expressing that each American should get more training than a high school diploma. Thereby, he pointed out that much of this aspiration will have to come from postsecondary CTE, namely community colleges, vocational training programs and/or apprenticeships (Kuczera and Field, 2013:18). He also acknowledged that the former “college for all” mentality needs to be significantly broadened to become a “post high school credential for all” mentality (Symonds et al., 2011:6).

3.2 Secondary Career and Technical Education

High schools provide comprehensive, general education as well as college preparation, but may also offer some vocational/career and technical courses and programmes at grade levels 9-12 and/or pre-vocational courses at earlier grades (grade 7 and 8) (Zirkle, 2012:33 et seq.). The scope of vocational education offerings varies greatly from state to state and depends on the institutions which can be broadly classified in three major types according to their educational orientation: comprehensive high schools, vocational/career and technical high schools and vocational schools/centers. The latter are associations of multiple high schools from a specified geographic region where students and schools benefit from this cooperation. Historically, such programs have been focused on preparing students for employment entry. Nowadays, CTE courses are seen as preparatory offerings for further vocational training in postsecondary institutions.

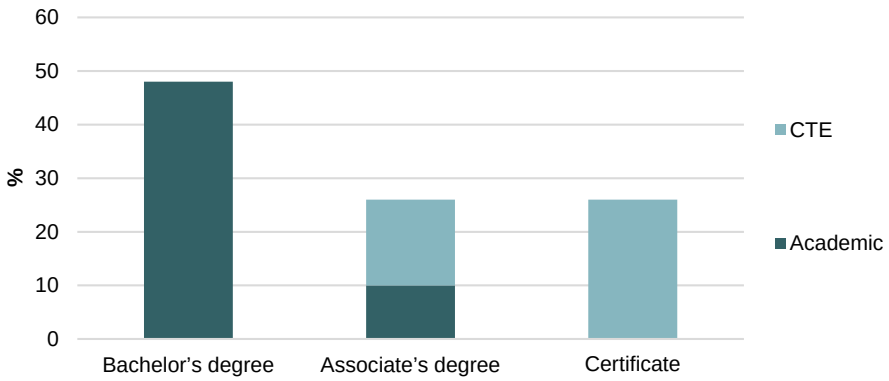
Compared to many other OECD countries, only few students in upper secondary education follow vocational programs leading to a particular profession or occupation (Kuczera and Field, 2013:15 et seq.). Earning CTE credits while still being in high school facilitates students the transition to postsecondary schools, meaning that “time-shortened” associate’s degrees can

be attended (Zirkle, 2012: 33 et seq.). This transition is in particular promoted by the *Tech Prep* program.

3.3 Postsecondary Vocational/Career and Technical Education

Although CTE education often begins at the upper secondary education level, job and career targeted education predominantly takes place in postsecondary institutions, mostly in form of 2-year courses leading to an associate's degree or to a certificate provided by a community college and many for-profit training institutions.

Figure 3: Percent of undergraduate credentials awarded by Title IV postsecondary institutions in 2010



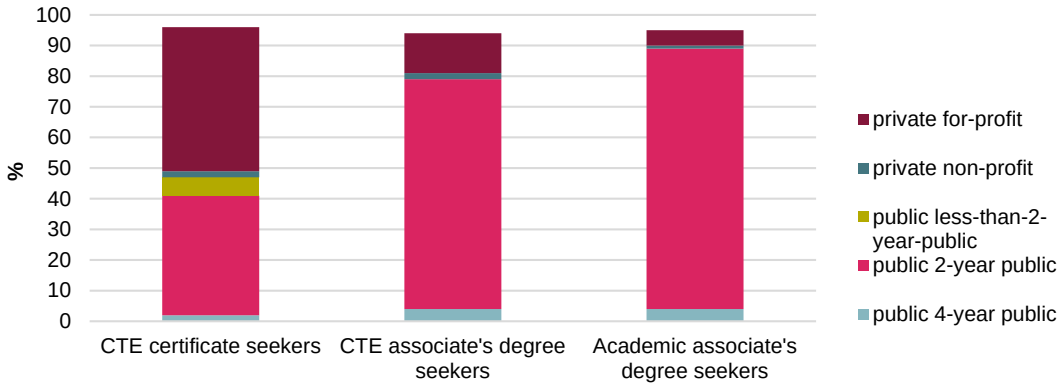
Source: NCES (2011).

Notes: 100% = 3'429'934 people.

However, associate's degrees cannot be unambiguously assigned to CTE education since that a significant number of these programs are rather academically orientated. Figure 3 provides an overview of the share of undergraduate credentials by degree and program content.

An associate's degree could therefore either serve to enter the labor market directly or to proceed to a 4-year institution depending on the programs' content (NCES, 2013:6 et seq.). Besides the associate's degrees and certificates, there are also on-the-job training programs in form of apprenticeships (see Section 3.3.2) (Kuczera and Field, 2013:28 et seq.).

Figure 4: Percentage distribution of credential-seeking sub-baccalaureate students, by type of Title IV postsecondary institutions in 2007-2008.



Source: NCES (2007-2008).

Regarding the diversity of institutions where CTE courses can be attended, Figure 4 reveals that most CTE certificate seekers attend private for-profit institutions, whereas the vast majority of CTE associate's degree seekers attend public 2-year institutions. Similar to latter ones, also the majority of academic associate's degree seekers attends public 2-year institutions. Additionally, there is a small share of students who attend more than one institution and therefore cannot be assigned conclusively.

The large share of students seeking for a CTE credential and attending private-for-profit institutions is further presented in Table 6. Most of these students are enrolled in 2-year programs whereas a substantial part of them also attended less-than-2-year institution. These students often seek for CTE certificates rather than CTE associate's degrees.

Public 2-year institutions are community colleges and are the far largest provider of CTE postsecondary programs and of public postsecondary education in general. Due to their importance, the next section will have a closer at this kind of institution.

Table 6: CTE credentials awarded by Title IV postsecondary institutions in 2010

Duration	Total (%)	Public (%)	Private, non-profit (%)	Private, for-profit (%)
4-year	17	5	3	9
2-year	65	46	1	18
less -than-2-year	18	2	1	15
Total (1'410'146)	100	54	5	42

Source: NCES (2011).

3.3.1 Excursus: Community Colleges

Community colleges are postsecondary institutions of higher education (ISCED 4, 5A/B level) that typically provide a two year curriculum leading to an associate's degree. Historically, these institutions are characterized by their social role and their local anchoring. While larger universities and colleges always offered academic courses and focused on research, community colleges responded to the local workforce needs by offering vocational training for everyone (Kasper, 2003:14). Community colleges are known for maintaining strong ties to local societal and labour market needs (for an overview cf. Dowd and Shieh 2013: 41).

Students attending community colleges have very different educational motivations: many students transfer to a university upon completion of their programme, while students in more VET-oriented programmes often directly enter the workforce or enrol in development or remedial education classes in order to meet entry requirements for any higher education institution.

A key factor for their ongoing popularity are the low tuition fees and the easy accessibility, meaning that community colleges very often accept all applicants with a high school diploma or any similar degree (i.e. GED, SAT). Adults who do not have a high school diploma are often accepted for admission to an *adult basic education program* or other special, non-degree granting programs. This so called *open door policy* attracts many low-income students and makes higher education accessible for students who otherwise could not attend such institutions including many who study part-time including many immigrant workers who lack sufficient English skills (Schmidtke, 2012:58).

However, due to the open-door policy and the low tuition fees, there is little incentive not to drop out of school which in turn results in a high dropout rate and generally a lower willingness to learn compared to their colleagues in 4-year institutions (Provasnik and Planty 2008:16 et seq.).

Students attending community colleges have various educational intentions which is reflected by the different programs and courses these schools provide. The following list tries to give an overview of the programs offered by community colleges:

- Programs that are strongly vocational orientated and lead to a final degree, either an associate's degree or a kind of certificate. Most of these programs are full time schooling programs and last for 2 years. These address students who look for an occupational degree rather than an academic one (see Figure 4).
- *Transfer programs* are programs designed for students who eventually want to proceed to a 4-year institution. In order to ensure transferability, community colleges might have

agreements with universities (i.e. articulation agreements), specifying which course credits can be transferred. The educational level of these programs is comparable to that of universities and is rather academically orientated. Transfer programs do not necessarily last two years and are not always awarded with an associate's degree (Schmidtke, 2012:64).

- *Development or remedial education* describes courses which mostly provide training and development of basic skills like math and literacy. These programs are often attended by students who graduated poorly from high school and need additional education in order to fulfil entry requirements for any higher education institution (Schmidtke 2012:61 et seq.).
- In the recent years, the number of community colleges offering baccalaureate programs has steadily increased, especially in technical and occupational fields which are not commonly provided by universities. Graduating with a baccalaureate degree normally requires 4-year course attendance (Thor and Bustamante, 2012:17 et seq.).

Summing up, community colleges often provide career and technical programs but are not simply vocational training schools. In fact, these are comprehensive institutions providing various educational services and are open to everyone. Therefore, they should not exclusively be regarded as vocational schools, but rather be seen as general institutions of postsecondary education (U.S. Department of Education, 2008b).

3.3.2 Work-Based Learning

In contrast to postsecondary CTE mainly taught in schools, work-based apprenticeships are very weakly integrated in the CTE system and play only a minor role in the vocational education sector. Work-based learning involves training on-the-job combining productive work with learning experience leading to an occupational proficiency. Apprenticeship programmes are highly concentrated in the construction, energy, manufacturing, transportation and communication sectors, as well as in administration occupations where little or no postsecondary education is required (Lerman, 2010:11). They typically last for 3-4 years. But there are also programmes that last for one year only, or 2000 hours. Additional classroom instruction of 144 hours per year of training is recommended. In total, about 1,000,000 – 1,500,000 apprentices are trained annually, whereas 500,000 of them are enrolled in a federally *registered apprenticeship program*. Registered apprenticeships are supervised by the *U.S. Office of Apprenticeship* and *State Apprenticeship Agencies*. Among their responsibilities is the provision of some of the core services like issuing of certificates of completion etc. All in all, the apprentices account for only 0.2% of the U.S. labor force, compared to 3.7% in Germany (Lerman, 2014).

The low number of apprentices show how uncommon the system of apprenticeships is. The minor role of apprenticeship programmes, i.e. plans containing all terms and conditions for the qualification, recruitment, selection, employment, and training of apprentices, is largely ascribed to the weak federal and state support and to the lack of incentives for employers to sponsor largely employer-financed programmes (cf. Lerman, 2014). However, there are future plans to reinforce and expand registered apprenticeships in sectors requiring mid- and high-skill workers with good employment prospects (Kuczera and Field, 2013:28).

3.4 Governance and Regulatory Framework of the VPET System

The first part of this section gives an overview of the governance structure of the US VPET system. The second part describes the regulatory framework regarding the community colleges and apprenticeships.

3.4.1 Governance

The relevant actors governing the US education system can be classified in federal, state and local level authorities. The federal government influences the education system only indirectly by enacting legislation which makes funds available for the states. The states are responsible for the formulation of the legislative framework for public schools. Each state is further divided into school districts, or local education agencies, which consist of local boards made up of elected representatives. The main purpose of the local boards is to give some weight to the needs of the local school system. Any decision regarding the curricula, specific course content and levels is either made by the actors at the state or the local level (UNESCO-UNEVOC, 2014).

The federal structure of the education system assigns many competencies and responsibilities to the states which results in 50 similar, yet different models for career and technical education. The local education agencies have the primary responsibility in the governance of the CTE system, though their actions are restricted by the state legislation which itself is heavily influenced by the federal legislation. In addition, the governance of the CTE system at the secondary and postsecondary level is further complicated by the multitude of ways the states distribute the responsibilities for the CTE system (UNESCO-UNEVOC, 2014).

At the secondary education level, CTE programmes are, to the most part, regulated in the same way as the rest of the compulsory education programmes at the secondary level that is in the same way as high schools.

At the postsecondary level, CTE is influenced by a vast range of policy instruments at the federal as well as at the state level. These instruments are based on different parts of the

legislation, driven by different policy rationales. Hence, as the rest of the education system, the administrative and supervisory structure of CTE at the postsecondary level is somehow hard to grasp. The influence at the federal level is largely given by a framework of accreditation requirements for institutions participating in various national funding programs. These requirements can also be regarded as a basic quality assurance system which sets incentives for high qualitative vocational education. Therefore, the CTE system's structure can be best described when looking at the different federal funding streams, their main purposes and their respective accreditation requirements.

The largest source of the federal funding system is the **Federal Student Aid** (Title IV of the Higher Education Opportunity Act, 2008)[12], which represents about half of all expenditure for postsecondary CTE (NCES, 2013:25). The Federal student aid provides financial support in terms of grants and loans for students who are enrolled in programs which fulfil direct federal, state and institutional accreditation requirements. In charge of the accreditation of institutions are federally recognized bodies which are monitored by the *Department of Education*. The accreditation process ensures a basic quality assessment by evaluating curricula, faculty admission practice and student service (Skinner, 2007;12 et seq.). Furthermore, institutions eligible for Title IV should provide the level of educational quality they promise by monitoring default rates and keep them within specified limits. As a last point, institutions must also be legally authorized by the state in which they are located. Often, this requires that institutions are degree-granting. However, students from schools which do not meet these requirements have no access to federal student aid (Kuczera and Field, 2013: 47 et seq.).

Another source of federal fund is given by the **Workforce Investment Act** (WIA) which superseded the Job *Training Partnership Act* as the main federal workforce development legislation.[13] The act comprises five titles, all providing some kind of workforce development activities and programs whereas the overall goal is to increase employment and earnings as well as skill improvement of workers and job seekers (Workforce Investment Act, 1998). Noteworthy institutions under *Title I* are the *Workforce Investment Boards* (WIB). Their main purpose is to allocate national, state and local funding to workforce development programs and overseeing them. Generally speaking, the state WIBs have an administrative function whereas the local WIBs have an executive role. The committee composition is partly predefined, whereas a minimum share of 50% of business representative is required. Furthermore, representatives of labor organizations are always part of state and local WIBs.

[12] Higher Education Opportunity Act, Pub.L. No. 110-315, § 122 Stat. 3078 (2008).
[13] Workforce Investment Act of 1998, Pub. L. No. 105-220, § 112, Stat. 936 (1998).

The five programs under Title I of the WIA are of particular interest since some of the services they provide can be seen as support for vocational education and training. In detail, these programs are *Adult* and *Dislocated Worker Activities, Youth Activities* and *Job Corps*.

The purpose of the first two is to assist individuals who have been terminated or laid off or are about to be laid off. Among possibly provided assistance are also training services like enhancing occupational skills, entrepreneurial training etc. (Bradley, 2013:15).

Youth Activities is a program shaped for low income individuals having some difficulties to stay on the normal educational track (e.g. school dropout, deficiencies in basic literacy skills, homeless etc.), aged 14 to 21. The main objective is to provide assistance in achieving academic and employment success through a variety of measures (e.g. foster connections to employers, providing training opportunities, summer employment, work experience in internships etc.).

Similarly, *Job Corps* is a program designed for disadvantaged and at-risk youth, aged 16 to 24. The purpose is to provide these individuals with skills needed to receive and hold a job, enroll in occupational training or higher education or to join the armed forces. Regarding CTE services, Job Corps attendees might receive vocational skill training, work-based learning as well as counseling services (Bradley, 2013:21).

Beside these programs, there are a bunch of other grant programs addressing other target groups but not primarily by providing CTE services. Federal funding for all these programs is allocated to states according to a formula, mostly based on the share of the respective target group. However, the WIA does not primarily support the CTE system. Thus only a part of the program funding can be accounted as support for postsecondary CTE.

Table 7 shows the estimated federal revenue sources for CTE programs under the Workforce Investment Act.

A policy instrument that is specifically earmarked for CTE is based on the **Carl D. Perkins Career and Technical Education Improvement Act of 2006 (Perkins IV)** which is a reauthorization of the *Carl D. Perkins Vocational and Technical Education Act* of 1998.[14] The main purpose of Perkins IV is to foster development of career and technical skills among secondary and postsecondary students who are enrolled in career and technical education programs. Perkins IV is composed of different authorized programs whereas the far largest one is the *Basic State Grants* program where over 90% of the all awarded funds flow to. These grants are allocated to states in order to develop, implement and to improve CTE programs

[14] Carl D. Perkins Career and Technical Education Improvement Act of 2006, Pub.L. No. 109-270, § 120 Stat. 684.

and activities for students. The allocation of the funding among the states is regulated by a formula in which factors like population size and age, as well as a state's per capita income are considered. The distribution within the state among local education agencies is regulated fairly flexibly letting the states and local districts partly determine by themselves which CTE programs and activities to implement and how to allocated funds between secondary and postsecondary education. Over the last years, an approximate share of 60 percent has flowed to secondary education programs whereas 40 percent have been allocated to postsecondary programs (Dortch, 2012:5-16).

In order to receive any funds under Perkins IV, CTE providers must comply with accountability requirements which are statutorily defined performance measures described by core indicators (Dortch, 2012:18). Among these core indicators for *postsecondary education* are CTE students':

- attainment of challenging CTE skill proficiencies;
- attainment of an industry-recognized credential, certificates, or degrees;
- participation in programs which lead to employment in non-traditional fields;
- placement in military service or apprenticeship programs or placements in employment.
- retention in postsecondary education or transfer to baccalaureate degree programs.

Core indicators for CTE students attending *secondary education* institutions are different and more focused on the attainment of certain skill levels, including transition to degree-granting postsecondary institutions rather than placement in employment. Furthermore, these indicators should prompt partnership among secondary and postsecondary institutions, business, industry and workforce investment boards (Dortch, 2012:18).

In general, performance measures help to determine whether the state's adjusted level of performance is met or not. In case of poor performance, the states might face sanctions which could lead to the withholding all or a portion of the states' funds.

Besides Basic State Grants (Title I) Perkins IV also authorized the *Tech Prep program* (Title II). The main objective of the Tech Prep program is to coordinate and combine secondary and postsecondary vocational training in order to develop a smoother and more coherent transition between these two educational levels. In detail, the program encompasses the last two years of secondary education and at least two years of postsecondary education, known as the 2+2 model, which might include a 2 year apprenticeship. Students successfully attending this program graduate with an associate degree or two-year certificate in a field of engineering technology, applied science, mechanical, industrial, or practical art trade, agriculture, health,

or business. Furthermore, they gain competences in communication math and science (U.S. Department of Education, 2014). The Tech Prep program also includes teacher in-service training in order to implement the program's curriculum more effectively and it requires equal access for *members of special populations* (e.g. individuals with disabilities, economically disadvantaged students, single parents) and an articulation agreement between secondary and postsecondary institutions (Dortch, 2012: 16).

Trade Adjustment Assistance (TAA) is a federal program, originally authorized under the *Trade Act* of 1974 whose purpose is to help workers having lost their jobs due to an increase of imports or shift in production in foreign countries. Assistance includes support to search for re-employment, whereas trade-affected workers can benefit from a range of various employment services. Among these services are also classroom and on-the-job training for professional development and personal skill enhancement. Therefore, some part of this federal funding can be counted as CTE services, even if it is not for initial vocational education. Furthermore, eligible workers receive unemployment benefits (Trade Readjustment Allowances) during periods of unemployment.

The Trade Adjustment Assistance is administered by the states and overseen by the US Department of Labor's Training Administration's Office (U.S. Department of Labor, 2012).

Besides career and technical education in a community college or any associated institution, learning for jobs is also provided by the apprenticeship system (see Section 3.3.2). Apprenticeships can be registered through the federal *Office of Apprenticeships (OA)* or through a state *apprenticeship agency (SAA)* which in turn is recognized by the OA. Even if there is no direct federal funding, the federal Office of Apprenticeships oversees registered apprenticeships (RA's) on basis of the *National Apprenticeship Act* which sets some basic standards. These standards define keystones of on-the-job training like the provision of a schedule, increasing schedule of wages, organized instructions in technical subjects etc.

Besides registering apprenticeships and the maintenance of a national database, the government's role is to promote the development of new programs in cooperation with the state agencies, to protect the safety and welfare of apprentices, to assure that all programs provide high quality training and produce skilled competent workers and to issue nationally recognized and portable certificates of completion (Lerman, 2008:12 et seq.).

Summing up, the main power in shaping the vocational education and training system rests with the states and local school districts.

3.4.2 The Regulatory Framework

In this part, the regulation of the community colleges will be explained first, followed by that of apprenticeships. Since the regulations vary by state, this section refers to the regulation in California or in North Carolina as examples.

A classification of the regulatory framework in California or in North Carolina regarding community colleges and apprenticeships with precise information about the legislation can be found in the appendix, section II.

The Regulation of Community Colleges

The regulation of community colleges is primarily in the hands of state and local legislators and agencies. In most cases, state legislation sets up a Community Colleges System with an independent board and administration agency (with the California Community Colleges System as the largest system of higher education in the world, comprising 112 community colleges). In California and North Carolina, system-wide policies are made by a state board for community colleges, elected by the Governor or by the state's legislator. The board's competencies include the regulation of academic minimum standards and graduation requirements, of standards for the employment of faculty staff, and of conditions for college districts to receive state financial support. These standards are administered by an office affiliated with the board to whom some of the board's competencies are usually delegated.
To a maximum degree permissible, however, the administration of community colleges is to be left with to the boards of local community college districts (governing one or several colleges) and individual college presidents, including the selection of education programmes and contents. These boards are publicly elected in California, while they are elected by the Governor and local government agencies in North Carolina. District boards are also entitled to levy taxes within their district to finance their campuses.

At a federal level, legislative influence is largely given by a framework of accreditation requirements for institutions participating in various national funding programmes; these requirements can also be seen as a basic quality assurance system which sets initiatives for high qualitative VET programmes, e.g. setting out accountability requirements for VET-providers. This is reflected in the funding of community colleges: while roughly 40% of funds stem from state and local government budgets, another 20% are federal grants, allocated through Pell Grants pursuant to the Higher Education Opportunity Act's Title IV (Federal Student Aid) and, to a much smaller extent, through the Carl. D. Perkins Career and Technical Education Improvement Act. Tuition and fees amount to roughly 15% of community college's budgets (cf. Dowd and Shieh 2013: 39).

The Regulation of Apprenticeships

Just like VET in general, the regulation of apprenticeship programmes is subject to extensive decentralization and is for the most part in the hands of state legislators and agencies and programme sponsors. Therefore, it is hard to characterize the system as a whole. There are apprenticeship programmes on the national level, administered by the Office of Apprenticeship within the Department of Labor (USDOL), as well as on the state and local level, administered by state departments and apprenticeship offices and councils. State apprenticeship offices and councils issue apprenticeship standards, e.g. regarding minimum wages, maximum hours, working conditions, criteria for selection procedures, etc., which often go beyond USDOL-standards.

Within these national and state standards, Local Area Apprenticeship Committees (LAACs), which are generally appointed by state apprenticeship councils on the demand of programme sponsors, administer concrete apprenticeship programmes with a great deal of autonomy, including the recruitment of apprentices, regulation of training content and supervision, and uniform application of all national and state regulations to individual apprentice agreements. However, many decisions taken by LAACs are subject to review by state apprenticeship offices or councils. LAACs are either jointly composed of employers *and* employees or unilaterally of employers *or* employees.

Classroom instruction content and standards are set out through LAACs or individual apprentice agreements. The content of work-based training, too, is decided on by LAACs, upon agreement with the programme sponsor.

3.5 Educational Finance of the VPET System

As the governance, the funding for the CTE system can be divided into three different levels: the federal, state and local level. The federal government offers funds to the states to support the CTE system. In order to get access to funds, the states have to submit a financial plan stating how the funds will be used to the Office of Vocational and Adult Education (OVAE), which is subordinated to the Ministry of Labor. The states themselves have to demand a similar financial plan form the educational agencies stating how the school districts will use the money. If a financial plan was accepted by the OVAE, the states have to write a report stating hoe and for which programme the funds had been used (UNESCO-UNEVOC, 2014).

Hence, the federal government plays an important role regarding the provision of financial support for students in secondary and postsecondary education. However, the high degree of decentralization implies that there are diverse, relatively autonomous institutions and multiple accreditation bodies, no national skill or occupational standards or multiple industry certifications. But it also brings about a low level of cooperation among employers, unions and

education institutions, and consequently little incentives to provide a more labor market orientated job-training (Kuczera and Field, 2013:28).

Table 7: Estimated sources of funding for postsecondary CTE, 2007-2008*

Revenue Source for Postsecondary CTE	US Dollars (in billions)
Federal Sources (Total)	**31.3**
Federal Student Aid (Title IV of the Higher Education Opportunity Act)	20.7
Federal tax expenditures for postsecondary education	8.1
Veterans educational benefits (2009)	1.1
Trade Adjustment Assistance	0.5
Workforce Investment Act (WIA postsecondary share)	0.5
Perkins Act	0.4
State Sources (Total)	**16.9**
State and local appropriations to public 2-year institutions	14.3
State grants to students	2.6
Institution and Other Sources (Total)	**19.7**
Institutional grants to students	7.5
Private and employer grants	2.5
Student/family payments	9.7
Total	**67.9**

Note: '*' unless otherwise noted
Source: NCES (2013).

As mentioned above, the largest fund for postsecondary CTE is the federal student aid. The second biggest flow is state support for public institutions (about 17 billion dollars). The funds from the *Perkins Act*, which are specifically allocated for CTE, are relatively small (about half a billion dollars). Table 7 shows all the funding streams allocated for postsecondary CTE in the year 2007-2008.

3.6 Supplying Personnel and Curriculum Development

As for the postsecondary education level in particular, the high decentralisation of the U.S education system give institutions a great deal of leeway in shaping the curriculum and making pedagogical decisions. From a national point of view, neither standard requirements for CTE teaching, nor standardized curricula can be determined. Qualification requirements for CTE teaching stuff are primarily set by institutional accreditation requirements and/or their respective governing boards.

In general, teachers in public schools need to be licensed or certified, this also hold for CTE teachers at public schools. Thereby, the requirements for certification vary by state. CTE teachers normally have to have a bachelor's degree[15] and work experience in the subject they want to teach. Therefore, many teachers gain work experience before they start teaching.

[15] This could be from a teacher preparation programme, where they chose a major subject and attend pedagogical courses besides this, or from studying a normal subject without attending pedagogical courses.

Prospective teachers with only a high school diploma can become teacher if they have gained extensive experience in their subject. Those who have not received teacher training during their studies or working experience have to make up for this by taking alternative certification programmes in order to a teacher's license (UNESCO-UNEVOC, 2014).

The Bureau of Labor Statistic's Occupational Outlook Handbook for Career and Technical Education Teachers defines essential competencies for CTE teachers. Among others, these comprise their communication, creativity and instructional skills (for more information see BLS, 2013).

Table 8: Comparison of CTE taxonomies adapted by NCES, 2012

CTE Statistics Taxonomy	Career Clusters
Agriculture and natural resources	Agriculture, food, and natural resources
Business management	Business management and administration
Business support	Finance
Marketing	Marketing
Communications	Arts, audio/video technology and communications
Communications technology	
Design	
Computer and information sciences	Information technology
Education	Education and training
Construction	Architecture and construction
Architecture	Science, technology, engineering, and mathematics
Engineering	
Science technologies	
Health sciences	Health science
Consumer services	Human services
Social services	
Protective services	Law, public safety, corrections, and security
Legal services	
Public services	Government and public administration
Public administration	
Manufacturing	Manufacturing
Repair	Transportation, distribution, and logistics
Transportation	
	Hospitality and tourism

Source: NCES (2012).

Regarding the curriculum, the *National Association of State Directors of Career Technical Education Consortium*[16] (NASDCTEc), representing the state and territorial heads of CTE across the nation, provides a taxonomy of CTE areas in order to introduce a fundamental framework for upper-secondary CTE programs (Jacques et al. 2013:5-6). The *Career Clusters* classification which comprises 16 career areas, is also adopted by the U.S. Department of Education's Office of Vocational and Adult Education (NCES 2012:4-6). Besides the Career

[16] National Association of State Directors of Career Technical Education Consortium (NASDCTEc): http://www.careertech.org.

Clusters, there are some other federally recognized taxonomies. Table 8 compares the Career Cluster taxonomy with that used by the National Center for Education Statistics.

4 Major Reforms in the Past and Problems for the Future

Early legislative developments (1917-1962)

The first piece of federal legislation addressing vocational education (VE) funding, the Smith-Hughes Act, was enacted in 1917 following an increasing advocacy for targeted industrial training among the influential class (Encyclopedia of Education, 2002). According to this act, a different high school track should be promoted alongside the academic track to instruct skills for entry-level positions. Cohorts following that curricula should be pushed into the labour market upon its completion, and as the Act stated “such education shall be less than college grade.” leaving little to no room to upgrade to post-secondary education (Edutopia, 2010). This marked the turning point of the federal government actively promoting VE, which it did through the funding of states’ VE expenses within a specific framework defined in the Act (Encyclopædia Britannica, 2014). For the most part, states chose to offer the VE and academic tracks under the same public schools, but the allocation of students therein is believed to have exacerbated gender, class and racial differences in outcomes. Importantly, the VE track was simply not effective at fulfilling its main purpose, which was to equip students with the set of skills sought after by the market. The legislation, it follows, has gotten its share of criticism.

Second wave of reforms, the transition from VE to CTE (1963-2005)

The Vocational Education Act of 1963 and its further reauthorizations were intended to improve the VE track’s quality relative to the Smith-Hughes Act days (Encyclopedia of Education, 2002). It broadened the VE scope to semi-skilled occupations (e.g. to business), and tried and enforced equal opportunities to all applicants, whether disabled or disadvantaged by offering special support as part of the 1984 Carl D. Perkins Vocational Education Act reauthorization. However it upheld the two tracks system and failed in its intent to improve the VE status. In the following years, the VE track was increasingly put into question, and its reputation suffered a great deal. “Voc-ed”, as it was commonly called, carried a pejorative connotation; it signalled poor education and carried social stigmas, essentially the opposite of the expectations placed on the reforms (Atlas, 2015).

A wave of initiatives tried and addressed the many issues of the program in the subsequent years, some bottom-up, such as “career academies” and high school collaborations (e.g. High Schools That Work), and others top-down, such as state laws and different federal legislation enacted in the 1990s (Edutopia, 2010). Most of them sought to increase the academic content of VE education and are as a result considered to have set the transition to today’s CTE. Yet

the difficulty for VE takers to upgrade to higher education remained beyond 1998 and the reauthorization of the Carl D. Perkins Vocational and Technical Education Act, which, despite strengthening its academic content, kept on defining VE as a path to careers "other than careers requiring a baccalaureate, master's, or doctoral degree" (Atlas, 2015).

Current strategy (2006-present)

Only with the Carl D. Perkins CTE Act in 2006 was VE effectively redefined as CTE. At the heart of the reform were the so-called “Programs of Study”. These smoothened out the transitions between CTE and college and promoted hybrid degrees between the two institutions, alleviating the impediments to access higher education. The reform successfully increased high school completion rates and college attendance among CET takers (Atlas, 2015). Several bills and amendments to the Carl D. Perkins CTE Act are currently under discussion in the federal chambers, in particular to better align post-CET transitions and to make CTE curriculums more demanding while enhancing their flexibility.

In parallel, under NASDCTEc, 42 states, the District of Columbia and Palau deliberately joined forces in 2012 to create the “Common Career Technical Core” (CCTC) initiative in order to develop CTE benchmarks and standards that are aligned across all participants (NASDCTEc, 2015). At the core of these standards is the goal of equipping students with skills that are relevant over their entire career-cycle as opposed to focussing on the skills of particular entry-positions only. That again is in line with the imperative of facilitating access from CET to college and other post-secondary degrees. Overall, US states are being proactive in taking on CTE reforms, with over 78 legislative changes in 2013 (ECS, 2014).

Future challenges

The United Nations (UNESCO-UNEVOC, 2014) point at two risks that have been ongoing and that need to be addressed. Firstly, the failure to enhance the perception of CET both from the demand and the supply sides perspectives. CET still has to struggle with the reputation from its weaker days and it will not be considered as a viable alternative to college unless this is resolved. Second, the inability to further improve progression opportunities from CET to post-secondary education would undermine the attractiveness of this education path. Obviously, its reputation is a function of the quality of education, and a better alignment of standards and requirements can enhance progression opportunities - the CCTC initiative may have an answer for both concerns.

References

Atlas (2015). Career and Technical Education Overview. Retrieved from: http://atlas.newamerica.org/career-technical-education.

Aud, S., Fox, M. A., & Kewal Ramani, A. (2010). *Status and Trends in the Education of Racial and Ethnic Groups.* NCES 2010-015. National Center for Education Statistics.

BLS, Bureau of Labor Statistics (2013). Occupational Outlook Handbook, 2012-2013 Edition, Career and Technical Education Teachers. Washington: U.S. Department of Labor.

Bradley, D. H. (2013). The Workforce Investment Act and the One-stop Delivery System. Congressional Research Service.

Carnevale, A., Smith, N., and Strohl, J. (2010*). Help Wanted: Projections of Jobs and Education Requirements Through 2018*. Georgetown: Georgetown University Center on Education and the Workforce.

Council on Foreign Relations (2013). Remedial Education, Federal Education Policy, Renewing America. Progress Report and Scorecard. New York: Council on Foreign Relations.

Dortch, C. (2012). Carl D. Perkins Career and Technical Education Act of 2006: Background and Performance. Congressional Research Service.

Dowd, A. C., and Shieh, L. T. (2013). Community College Financing: Equity, Efficiency, and Accountability. The NEA 2013 Almanac of Higher Education: National Education Association.

Dutta S., Lanvin B., and Wunsch-Vincent S. (2014). The Global Innovation Index 2014: The Human Factor in Innovation. Fontainebleau, Ithaca, and Geneva: Cornell University, INSEAD, and WIPO.

Eckel, P. D., King, J. E. (2004). An Overview of Higher Education in the United States: Diversity, Access, and the Role of the Marketplace. American Council on Education.

ECS, Education Commission of the States (2014). The Progress of Education Reform. Denver.

Edutopia (2010). Career and Technical Education: Research Roundup. Retrieved from: http://www.edutopia.org/stw-career-technical-education-research-roundup.

Encyclopædia Britannica (2014). Smith-Hughes Act. Retrieved from: http://www.britannica.com/topic/Smith-Hughes-Act.

Encyclopedia of Education (2002). Vocational and Technical Education. Retrieved from: http://www.encyclopedia.com/topic/vocational_education.aspx#1.

Eurostat (2015a). Gross Value Added and Income by A*10 Industry Breakdowns. Retrieved from: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=nama_10_a10&lang=en

Eurostat (2015b). Employment by A*10 Industry Breakdowns. Retrieved from: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=nama_10_a10_e&lang=en.

FRED, Federal Reserve Economic Data (2015). Gross Domestic Product: Net Exports of Goods and Services. FRED Economic Data. Retrieved from: https://research.stlouisfed.org/fred2/series/A019RC1A027NBEA.

Heckman, J. J., and LaFontaine, P. A. (2010). The American High School Graduation Rate: Trends and Levels. *Review of Economics and Statistics*, 92(2), 244-262.

IMF, International Monetary Fund. (2015). *General Government Net Lending/Borrowing, General Government Gross Debt*. World Economic Outlook Database. Retrieved from: https://www.imf.org/external/pubs/ft/weo/2015/01/weodata/weoselgr.aspx.

Jacques, C., and Potemski, A. (2013). *21st Century Educators: Developing and Supporting Great Career and Technical Education Teachers*. Washington DC: American Institutes for Research.

Kasper, H. T. (2003). The Changing Role of Community College. *Occupational Outlook Quarterly*, 46(4), 14-21.

KOF. (2015a). *KOF Index of Globalization*. KOF Swiss Economic Institute, ETH Zürich. Retrieved from: http://globalization.kof.ethz.ch/query/.

KOF. (2015b). *KOF Youth Labour Market Index YLMI*. KOF Swiss Economic Institute, ETH Zurich. Retrieved from: http://viz.kof.ethz.ch/public/yunemp.

Kuczera, M. and S. Field. (2013). A Skills Beyond School Review of the United States, OECD Reviews of Vocational Education and Training. Paris: OECD Publishing. Retrieved from: http://dx.doi.org/10.1787/9789264202153-en.

Lerman, R. (2008) Widening the Scope of Standards Through Work-Based Learning. 30th Research Conference of the Association for Public Policy and Management. Los Angeles, California. November 2008.

Lerman, R. I. (2010). *Training Tomorrow's Workforce: Community College and Apprenticeship as Collaborative Routes to Rewarding Careers*. Washington, DC: Center for American Progress.

Lerman, R. (2014). Do Firms Benefit from Apprenticeship Investments? *IZA World of Labor* 55. Retrieved from: http://wol.iza.org/articles/do-firms-benefit-from-apprenticeship-investments-1.pdf.

NASDCTEc, National Association of State Directors of Career Technical Education Consortium (2015). The Common Career Technical Core. Retrieved from: http://www.careertech.org/CCTC.

NCES, National Center for Education Statistics (2007-08). National Postsecondary Student Aid Study, Table P41. Retrieved from: http://nces.ed.gov/surveys/ctes/tables/P41.asp.

NCES, National Center for Education Statistics (2011). Digest of Education Statistics 2011. Retrieved from: http://nces.ed.gov/pubs2012/2012001.pdf.

NCES, National Center for Education Statistics (2012). U.S. Background Information Prepared for the OECD Postsecondary Vocational Education and Training “Skills Beyond School” Study. Retrieved from: http://nces.ed.gov/surveys/ctes/pdf/PostsecVET.pdf.

NCES, National Center for Education Statistics (2013). Career/Technical Education Statistics. U.S. Background Information Prepared for the OECD Postsecondary Vocational Education and Training “Skills Beyond School” Study.

NCES, National Center for Education Statistics (2015). Digest of Education Statistics. The Structure of the Education System of the United States. Retrieved from: http://nces.ed.gov/programs/digest/d11/figures/fig_01.asp.

OECD (2013). Education at a Glance 2013: OECD Indicators. Paris: OECD Publishing.

OECD (2014). OECD Factbook 2014: Economic, Environmental and Social Statistics. Paris: OECD Publishing. Retrieved from: http://dx.doi.org/10.1787/factbook-2014-en.

OECD. (2015a). Annual National Accounts. OECD.StatExtracts. Retrieved from: http://stats.oecd.org/Index.aspx?DataSetCode=SNA_TABLE1.

OECD. (2015b). Gini, Poverty, Income, Methods and Concepts. OECD Income Distribution Database (IDD). Retrieved from: http://www.oecd.org/social/income-distribution-database.htm.

OECD (2015c). Employment by Activities and Status (ALFS) Dataset. Retrieved from: https://stats.oecd.org/Index.aspx?DataSetCode=ALFS_EMP.

OECD (2015e). OECD Employment Outlook 2015. Paris: OECD Publishing.

OECD. (2015d). Annual Labour Force Statistics. OECD.StatExtracts. Retrieved from: http://stats.oecd.org/Index.aspx?DataSetCode=LFS_SEXAGE_I_R.

Provasnik, S., and Planty, M. (2008). *Community Colleges: Special Supplement to The Condition of Education 2008*. Statistical Analysis Report. NCES 2008-033. National Center for Education Statistics.

Renold, U., Bolli, T., Egg, M. E., & Pusterla, F. (2014). *On the Multiple Dimensions of Youth Labour Markets - A Guide to the KOF Youth Labour Market Index.* Zurich: KOF Swiss Economic Institute.

Schmidtke, C. (2012). The American Community College. In Barabasch, A., Rauner, F. (eds.). *Work and Education in America*, Technical and Vocational Education and Training: Issues, Concerns and Prospects, 15 (pp. 53-75). Wiesbaden: Springer.

Skinner, R. (2007). Institutional Eligibility for Participation in the Title IV Student Aid Programs Under and the Higher Education Act: Background and Reauthorization Issues. Congressional Research Service, Library of Congress.

Snyder, T. D., and Dillow, S. A. (2013). *Digest of Education Statistics, 2012*. NCES 2014-015. Washington, DC: National Center for Education Statistics.

Stüwe, K. (2008). Das politische System der USA, in: Stüwe, K. and Rinke, S. (eds.), *Die politischen Systeme in Nord- und Lateinamerika.* Eine Einführung (pp. 538-580). Wiesbaden: Springer.

Symonds, W. C., Schwartz, R. B., and Ferguson, R. (2011). P*athways to Prosperity: Meeting the Challenge of Preparing Young Americans for the 21st Century*. Cambridge, MA: Harvard Graduate School of Education.

Thor, L. M., Bustamante, C. (2012). The Community College Baccalaureate. In. Remington. N. and Remington, R. (eds.). *Alternative Pathways to the Baccalaureate*: Do

Community Colleges Offer a Viable Solution to the Nation's Knowledge Deficit? (pp. 17-36). Sterling, Va: Stylus Pub.

UIS, UNESCO Institute for Statistics. (2012). *International Standard Classification of Education ISCED 2011*.

UNESCO-UNEVOC. (2014). *World TVT Database*. Bonn. Retrieved from http://www.unevoc.unesco.org/go.php?q=World+TVET+Database.

U.S. Department of Education. (2008a). State Role I – Primary and Secondary Education. Network for Education Information. Retrieved from http://www2.ed.gov/about/offices/list/ous/international/usnei/us/edlite-structure-us.html

U.S. Department of Education. (2008b). Organization of U.S. Education: Tertiary Institutions. Network for Education Information. Retrieved from http://www2.ed.gov/about/offices/list/ous/international/usnei/us/edlite-structure-us.html.

U.S. Department of Education (2014). Tech-Prep Education. Retrieved from: http://www2.ed.gov/programs/techprep/index.html.

U.S. Department of Labor. (2012). Employment and Training Administration. Retrieved from http://www.doleta.gov/tradeact/factsheet.cfm.

WEF, World Economic Forum (2014). The Global Competitiveness Report 2014-2015: Full Data Edition. Geneva: World Economic Forum.

World Bank. (2015a). External Balance on Goods and Services (% of GDP). Retrieved from http://data.worldbank.org/indicator/NE.RSB.GNFS.ZS.

World Bank. (2015b). Economy & Growth: Trade (% of GDP). Retrieved from http://data.worldbank.org/indicator/NE.TRD.GNFS.ZS.

Zirkle, C. (2012). The Multitiered CTE/VET System in the United States – From High School to Two-Year Colleges. In Barabasch, A., Rauner, F. (eds.). *Work and Education in America, Technical and Vocational Education and Training: Issues, Concerns and Prospects,* 15 (pp. 33-51). Wiesbaden: Springer.

Appendix A

Case Studies of VET Systems in selected US States

i) South Carolina

Note: the information for this section is retrieved from the Apprenticeship Carolina Website (Apprenticeshipsouthcarolina, 2015).

South Carolina launched a registered youth apprenticeship program consisting of two complementary components. On one hand, supervised on-the-job training which is provided by the employer at the workplace and tailored to meet job-specific needs. On the other hand, related technical instructions, which is often delivered by a technical college and serves to convey the theory underlying the skills being learned on-the-job.

Targeted industries are construction, energy, healthcare, information technology, manufacturing, transportation, distribution and logistics, and tourism and service industries. Currently, about 60 companies participate in the program.

Companies may benefit in the following ways:

- They receive a tax credit of $1'000 per apprentice per year for up to four years.
- On-the-job training along with job-related educational instruction results in a higher skill level among employees.
- Increased employee quality, productivity motivation and morale

For students, the program combines high school curriculum and career and technology training with on-the-job training performed at a local business. Moreover, students can earn a salary through part-time work while earning a national credential.

Besides its apprenticeship system for the youth, South Carolina also offers apprenticeships for adults. Thereby, adlts receive on-the-job training, namely work experience (with job rotation) and job related education of at approximately 144 hours (during or outside the regular working hours) in each year of the apprenticeship. During the training on-the-job they are taught by qualified instructors. This means that the instructor has to meet the requirements of the State Department of Education or to be recognized to have expertise in the specific occupation. In addition, he has to have training in teaching techniques.

ii) Tennessee

In a conference held in March 2012, secondary and postsecondary educators, state officials and local industry representatives saw the need to bring academics and industry closer together. Therefore, a program was launched which aimed at encouraging employer involvement in shaping curricula in both secondary and postsecondary education and to roll out a statewide apprenticeship strategy (The Chronicle of Higher Education, 2012).

In June 2012, Tennessee joined the *Pathways to Prosperity Network*, a collaboration between the Harvard Graduate School of Education (HGSE), Jobs for the Future (JFF)[17] and currently nine states focused on ensuring that many more young people complete high school, attain a postsecondary credential with currency in the labor market, and launch into a career while leaving open the prospect of further education. To this end, participating states together with employers and educators cooperate to build career pathways systems for high school-aged students.[18]Each state is led by a coalition of stakeholders. The work initially focuses on two to three regional labor markets within each state, but the long-term goal is to create a statewide system (Department of Education, Tennessee, 2015).

In December 2012 the Tennessee state network (Pathways Tennessee) was formed with the creation of a State Planning & Implementation Team and the identification of two pilot regions. One of these pilot region (Southeast) is presented hereafter. The mission of Pathways Tennessee is to provide Tennessee students rigorous academic/career pathways, which are linked to economic and labor market needs and trends (ibid.).

Southeast Tennessee has identified Advanced Manufacturing and Information Technology as critical career clusters to launch its Pathways Program. During the 2013-2014 school year, a regional consortium of teams designed the curricula and the two career pathways will be available to students at schools throughout the participating counties in the fall of 2014. Students will learn about local businesses through field trips, job shadows, internships and guest speakers. If they choose to pursue one of the pathways developed in the program, they will take courses designed to prepare them for jobs in that field while also spending time in real-world environments (Southeast Tennessee Pathways to Prosperity, 2015).

[17] JFF was founded in 1983 and aims to expand the college, career, and life prospects of low-income youth and adults across 25 states (www.jff.org).

[18]Harvard Graduate School of Education (www.gse.harvard.edu).

iii) North Carolina

In North Carolina, apprenticeships start at the high school level and are shaped as an industry-driven education and career-training program based on recognized industry standards (Public Schools of North Carolina, 2004). It consists of the following steps and involved parties North Carolina Department of Public Instruction (2015):

- A student enters an apprenticeship in high school with at the minimum age of 16
- He works on a part-time basis during the school year and full-time in the summer
- The employer monitors and evaluate the apprentice's work-based learning (the apprentice is taught and supervised by a journeyman)
- Related academic and technical instruction is coordinated by the school to connect work-based and school-based learning
- After graduation from high school, the student continues his apprenticeship and continues his related instruction usually at the local technical/community college
- When the apprentice successfully completes the required number of hours of work-based learning and related classroom instruction, certification of occupational and academic mastery is awarded

The program is registered and monitored by the North Carolina Department of Labor, Apprenticeship and Training Division, which provides assistance to the employer and to the apprentice and certifies both the training program and the newly trained journeyman. The program usually takes two to four years to complete and requires at least 144 hours of related instruction for each 2'000 hours of work-based instruction (Public Schools of North Carolina, 2004:5). A successful apprenticeship program will be described in the following.

Datwyler

The *Datwyler Group* is a focused industrial component supplier with leading positions in global and regional market segments. With a total of more than 50 operating companies, sales in over 100 countries and some 6'500 employees, the *Datwyler Group* generates annual revenue of about CHF 1'300 million.[19]

In the United States, *Datwyler* today employs about 80 people. But when Peter Dätwyler – son of *Datwylers* founder Max Dätwyler – arrived in North Carolina in 1990, he soon discovered that when it came to recruit technically skilled people, he wasn't in Switzerland anymore. Therefore, he decided together with a local business owner to approach Central Piedmont Community College (CPCC) to set up an apprenticeship program with Switzerland serving as a role model. Despite a slow start, the initiative launched successfully in 1996, with the first

[19] www.datwyler.com

class to graduate in 2000 – hence the program's name, *Apprenticeship 2000*[20] (Heston, 2014:66-68).

Today, the eight partner companies which constitute Apprenticeship 2000, offer several dozen apprenticeships per year. The qualification process starts in high school, where students who meet certain requirements pertaining to grade point average (GPA), attendance and hands-on courses are, together with their parents, invited to an open house, where they get an understanding about what the program is about. After the open house, students attend orientation events during which they undergo some testing. Certain students are then invited to a six-week summer internship program, during which the attend CPCC two days and work for three days a week. Based on the student's performance during the internship, *Datwyler* chooses one or two apprentices to participate in the four-year program. After graduation from high school, the apprentices are hired as full-time *Datwyler* emoployees and are payed for five days per week, even though they work four days and attend classes on the fifth. *Datwyler* also pays their way to earn their associate's degree in mechatronics engineering technology. After graduation they're guaranteed a job though there's no contract requiring students to stay on a certain amount of time after completion of the program, "but most want to stay because of the culture here", says Bob Romanelli, *Datwyler's* apprenticeship coordinator (Heston, 2014:68).

iv) Massachusetts

Apprenticeships in Massachusetts combine structured on-the-job training supervised by a journeyperson with classroom instruction at an approved training site. The purpose is to provide students with a comprehensive knowledge of their selected occupation. Apprenticeships are offered for a wide range of career field such as biotech, medical, childcare, security and construction. Apprentices are paid according to a progressive schedule for wage increases over the term of the apprenticeship as listed on the signed Apprenticeship Agreement (EOLWD, 2015a).

Apprenticeships are designed as a formal training program, registered with the State of Massachusetts, Department of Labor Standards, which has the responsibility for the development, implementation and monitoring of apprenticeship programs in Massachusetts. The Apprentice Registration Agreement is a legal, binding document between the apprentice, the company and the state of Massachusetts, where the exact terms and conditions, such as pay raises, the required hours of on-the-job training and related classroom instruction are stated. As a result of this contract, an apprenticeship in Massachusetts is not only concerning

[20] www.apprenticeship2000.com

two parties (the employer and the apprentice), but three parties with the Department of Labor as important overseeing body (EOLWD, 2015a).

A probationary period is required in each apprenticeship and both, the employer and the apprentice can cancel the agreement during said period by notifying the Division of Apprentice standards in written. Besides, school attendance is an important and integral part of the program and the employer is obliged to release the student from work during classes. Repeated failure to attend school may therefore lead to termination of the apprenticeship. Another important characteristic of the program is the obligation to maintain monthly and signed records of the apprentice's progress, the so called Apprentice Progress Record (EOLWD, 2015b).

v) Illinois

In Illinois, an apprentice is a paid worker who is enrolled in a special training program administered by an employer together with a labor organization or trade association. Most apprentices work in the trades related to construction (IDES, 2015).

Most apprenticeships take three to five years to complete and typically include 2'000 hours of on-the-job training, and a minimum of 144 hours per year of related classroom instruction, which is exactly is in the apprenticeship program in North Carolina. Wages vary widely for different trades, with beginning apprentices typically earning from 30 to 70 percent of a full employee's wage for the given trade. Pay is gradually increased over the length of the apprenticeship until training is completed, and the apprentice graduates to full trade person status (IDES, 2015). Students who are interested in becoming an apprentice can search for a position on a web platform, where apprenticeship offers are published.

vi) California

In the state of California, apprenticeships are designed to combine on-the-job training with related instruction at school. Each program in the respecting trades – mainly skilled crafts – operates under apprenticeship training standards in accordance with state and federal laws. An apprenticeship committee – the Joint Apprenticeship Committee – determines the standards for training of its occupation and supervises the training of apprentices (State Department of Industrial Relations, 2015).

In almost every skilled occupation, more than basic knowledge of arithmetic is essential. However, the ability to read, write and speak well of course in beneficial in every profession, but in some apprenticeships it is more important than in others. In many skilled professions, persons with a high school diploma or its equivalent are preferred (State Department of Industrial Relations, 2015).

The period of training lasts from one up to six years, depending on the profession, but most are for four years. The apprentices start at a percentage of the skilled worker's wage and receive increases at regular intervals . Starting rates are usually 35% to 50% and increases are normally given every six months. Additional to the job-related training, apprentices need to attend classes of related technical instruction, usually in public schools. The aim is to give students a comprehensive understanding of the theoretical aspects of their work. In most professions, this means attending four hours of evening classes each week, for at least 108 hours a year. The teaching includes such subjects as safety laws and regulations, mathematics, drafting, blueprint reading and other sciences connected with the profession. Upon completion of the program, apprentices are issued a "Certificate of Completion" by the State of California (State Department of Industrial Relations, 2015).

vii) New York

In New York - as in most of the states described above – apprenticeships comprise of two interrelated parts: Paid on-the-job training and related classroom instruction. To become an apprentice, students need to be at least 18 years old or at least 16 years if they get parental approval. The length of training varies from one to six years, depending on the trade. There's a written contract between the apprentice and the employer that states their rights and duties. The agreement needs to be approved and registered by the New York State Department of Labor (Department of Labor, 2015).

To become a registered apprentice one must meet the employer's minimum qualifications for employment. Each employer has different demands, but most require at least a high school diploma or an equivalent degree. More far-reaching requirements may include specific high school courses, prior experience or occupationally-related courses (ibid.).

In New York, each apprenticeable occupation has a standard training outline to assure that apprentices across the state have the same set of skills at the end of their education. Apprentices work under the guidance of an experienced journeyman from whom they learn the skills of the occupation. At the same time, as mentioned before, they need to attend classroom training, which is usually in the evenings and held at a trade school or community college (ibid.).

When successfully completed, the Department of Labor awards the apprentice with a "Certificate of Completion", which is a nationally-recognized credential. Moreover, a new trend for apprentices is to additionally earn an educational degree, which builds on the required classroom instruction. This expanded classroom instruction is offered at the community college level and allows the apprentice to earn an associate's degree (ibid.).

Apprenticeship training is usually offered by the employer at no cost for the apprentice but in some rare instances where the apprentice is asked to pay for the cost of the classroom instruction. In other cases, the employer may pay for the related instruction but specifies that if the student leaves the program before completion, he must pay back those costs (Department of Labor, 2015).

References (Appendix A)

Apprenticeship South Carolina (2015). Apprenticeship Carolina™. Website: http://www.apprenticeshipcarolina.com/index.html.

Department of Education, Tennessee (2015). Website: www.state.tn.us/education.

Department of Labor, New York (2015). Apprenticeships. Website: labor.ny.gov/apprenticeship/general/registration.shtm.

EOLWD, Executive Office of Labor and Workforce Development (2015a). Apprenticeship Programme. Website: www.mass.gov/lwd/labor-standards/das/apprenticeship-program.

EOLWD, Executive Office of Labor and Workforce Development (2015b). Apprenticeship Progr. Website: http://www.mass.gov/lwd/docs/dat/apprentice-handbook-508.pdf.

Heston, T. (2014). Apprenticeships, North Carolina-Style: Charlotte Manufacturer Helps Bring European-style Apprenticeships Stateside. *The Fabricator*, pp. 66-68.

IDES, Illinois Department of Employment Security (2015). Apprenticeship. Website: http://www.ides.illinois.gov/Pages/Apprenticeship.aspx.

North Carolina Department of Public Instruction (2015). Career and Technical Education. Retrieved from: http://www.ncpublicschools.org/cte/curriculum/work-based/types/apprenticeship/.

Public Schools of North Carolina (2004). *Handbook: High School Apprenticeship.* Raleigh: The North Carolina Department of Public Instruction.

Southeast Tennessee Pathways to Prosperity (2015). Website: www.setnpathways.org.

State Department of Industrial Relations, California (2015). Apprenticeship Programs Information Guide. Retrieved from: http://www.dir.ca.gov/databases/das/descOfAppr.html.

The Chronicle of Higher Education. (November 2012). Apprenticeships Make a Comeback in the United States. *The Chronicle of Higher Education*.

Appendix B

Regulatory Framework on Vocational Education and Training in the USA (Apprenticeships and Community Colleges)

The following table gives a more detailed overview on certain aspects of legislation on apprenticeships and community colleges in the U.S., in particular regarding the overall governance including applicable statutes and administrative bodies, the role and content of education, the regulation of work-based training, financial attributes, and VET teachers' education. Where regulation is largely left to the states, or states' laws differ greatly, the table refers to the regulation in California or in North Carolina as examples.

Dimension	Explanation	Apprenticeship	Community colleges
I. Overall governance			
1. Principal statute	Reference and year of publication	USA: National Apprenticeship Act (1937; USNAC) California (CA): California Labor Code, Division 3, Chapter 4: Shelley-Maloney Apprentice Labor Standards Act (1939; CALC) North Carolina (NC): North Carolina General Statutes, Chapter 94: Apprenticeship (NCGS)	California (CA): California Education Code, Division 7: Walter Stiern Act (CAEC) North Carolina (NC): North Carolina General Statutes, Chapter 115D: Community Colleges (NCGS)
2. Secondary statutes	Reference and year of publication	USA: Regulations by the Department of Labor (USDOL) In the states, secondary regulations are mainly set out by the secretaries of the responsible ministries (see below, I.3) and apprenticeship councils, e.g. California Administrative Code, Title 8, Chapter 2 (regulation by CACAC; see below, I.4.a)	Federal statutes: USA: Higher Education Opportunity Act (2008), Title IV: Federal Student Aid Carl. D. Perkins Career and Technical Education Improvement Act (2006)
3. Responsible ministry		USA: USDOL CA: Department of Industrial Relations (CADIR) NC: Department of Commerce (NCDOC)	USA: Department of Education (USDOE) States: Instead of oversight by a state Department of Education (CA: until 1967; NC: until 1979), state legislation now regularly establishes community colleges systems with separate boards (cf. Sect. 70900 CAEC; see below, I.4) Accreditation of institutions eligible to Title IV student aid: federally recognized bodies which are overseen by USDOE
4. National organisation			
a. Administration	Who is responsible for the administration of VET?	USA: Office of Apprenticeship (USOA) CA: Division of Apprenticeship Standards (CADAS) and California Apprenticeship Council (CACAC; Sect. 3070 CALC)	CA: California Community Colleges Board of Governors (CABOG), California Community Colleges Chancellor's Office (CACO), consisting of ten divisions, and on the district level Community Colleges Districts Boards of Trustees (CABOT; most districts consist of one college, the biggest consisting of nine)

		NC: Apprenticeship and Training Bureau (NCATB) and Apprenticeship Council (NCAC; Sect. 94-2 NCGS) CACAC and NCAC issue rules and regulations (partially subject to approval by CADIR/NCDOC), e.g. regarding minimum wages, maximum hours, working conditions for apprentice agreements (apprenticeship standards), equal opportunities (affirmative action), criteria for selection procedures, etc. (Sect. 3071 CALC; Sect. 94-2 NCGS); furthermore, in NC the NCAC's approval is needed to appoint the Director of Apprenticeship (head of NCATB; Sect. 94-3 NCGS) Administration of concrete apprenticeship programmes through Local Area Apprenticeship Committees (LAACs): they recruit, select and supervise the training of apprentices, uniformly apply rules and regulation to apprentices, i.e. approve apprentice agreements, take affirmative action to provide equal opportunities (Sect. 3074, 3076, 3079 CALC; Sect. 94-5.c NCGS) Apprenticeship programmes may be administered by joint LAACs (constituted of both employers and employees) or unilateral LAACs (just employers *or* employees) or even by an individual employer (Sect. 3075 CALC; Sect. 94-5.a.5 NCGS); LAACs are generally appointed by the CACAC/NCAC on demand of programme sponsors, and they may themselves appoint representatives with the authority to implement and administer any standards adopted by the LAAC (Sect. 3074 CALC; Sect. 94-5.b NCGS) Apprenticeship programmes are audited and supervised by CADAS to ensure that the programme audited complies with its own and CALC standards (Sect. 3073, 3073.1 CALC)	CABOG's 17 members are elected by the Governor (Sect. 71000 CAEC) and in turn elect the CACO (Sect. 71090.a CAEC); CABOTs are elected through public election in the respective districts (Sect. 72101, 72103.a CAEC) NC: North Carolina State Board of Community Colleges (NCBCC), Community Colleges System Office (NCSO), and on the local level Community Colleges Boards of Trustees (NCBOT; governing individual community colleges) NCBCC's 21 members consist of state government executives, the highest student's representative, and state and local representatives, partly elected by the Governor, partly by the state legislator (Sect. 115D-2.1.b NCGS) CABOG/NCBCC set system-wide policy, e.g. minimum academic standards and graduation requirements, minimum standards for the employment of staff, minimum conditions entitling districts to receive state financial support, and administer state support programmes (Sect. 70901 CAEC; Sect. 115D-5.a NCGS); many of CABOG/NCBCC's powers are administered by or even delegated to CACO/NCSO (Sect. 71090.b CAEC; Sect. 115D-3 NCGS) To a "maximum degree permissible" (Sect. 70901.a CAEC), the administration of community colleges is to be left to local authorities, i.e. CABOTs/NCBOTs and college presidents who run individual campuses

b. Representation, advice	Are there institutions representing groups such as the “social partners”, comprising the employees’ as well as the employers’ side, vocational teachers, which submit expert opinions regarding VET to the competent bodies or exercise statutory powers?	Yes USA: Advisory Committee on Apprenticeship (USACA; Sect. 2, 50a USNAC) CA: CACAC (Sect. 3070 CALC) NC: NCAC (Sect. 94-2 NCGS) Additional representation through LAACs (Sect. 3075 CALC; Sect. 94-5.a.5 NCGS)	Yes (see below, I.4.c)
c. Mandatory representation of:	Do the three groups listed below have a say in the VET system, i.e. legally specified controlling and voting rights?		
- Employers		Yes (USACA, CACAC, NCAC, LAACs)	Not necessarily (CABOT members are publicly elected; NCBOT members are elected partly by the Governor, partly by local education agencies; see above, I.4.a)
- Trade unions/employees		Yes (USACA, CACAC, NCAC, LAACs)	CA: Yes (CABOG; Sect. 71000.d CAEC) NC: Not necessarily
- Vocational teachers		Partly (USACA and LAACs, without voting right)	CA: Yes (CABOG; Sect. 71000.c CAEC) NC: Not necessarily (for NCBOTs, full-time vocational teachers are even formally non-eligible; Sect. 115D-12.b1 NCGS)

5. Number of initial VET programmes	Is there a legally specified number of officially recognized apprenticeable/initial VET occupations?	No Over 1'000 occupations covered, number growing	No
6. Minimal skill level for apprenticeships	Is apprenticeship formally reserved for "crafts" and excluded for semi-skilled/routinized work? If not, is there more than one level of skill attainment (e.g. "craft" and "assistant craft")?	No	n/a
7. Training duration (years)	Is there a minimum VET programme duration?	One year or 2'000 hours of reasonably continuous employment (Sect. 3077 CALC; Sect. 94-6 NCGS) However, most programmes range from one to six years, with the majority at four years in length	Primarily, community colleges are two year-institutions For students who do not pursue a degree, often classes shorter than two years are offered (e.g. for students who need basic skills education in order to fulfil entry requirements for any higher education institution)
II. Role and content of education			
1. Mandatory (part-time) educational segment			
a. In general	Is there a mandatory classroom segment for apprentices additional to the work-based training (dual system)?	No However, education in related and supplemental subjects is recommended (see below, II.2.b)	Yes Generally, the education at community colleges is school-based only
b. Non-adults	If not, is there a mandatory classroom segment for those	n/a	n/a

	under the age of legal adulthood?		
2. Shares of the different instruction segments			
a. In general	Is the share of the different instruction segments legally specified?	Generally not The shares are set out by programme administrators (LAACs) or in the individual apprentice agreement (Sect. 3078.d CALC; Sect. 94-7.4 NCGS)	n/a (see above, II.1)
b. Classroom/off-the-job instruction	What is the share of classroom/off-the-job instruction as % of total time spent in VET?	For each year of training, a minimum of 144 hours of related classroom instruction is recommended (Sect. 3078.d CALC; Sect. 94-6 NCGS) Generally, classroom education during an apprenticeship is equivalent to one year of community college Such education (job-related instruction, technical training, other certified training) is provided by apprenticeship training centres, technical schools, community colleges, or computer-based learning institutions	n/a (see above, II.1)
c. General education	Is the share of general education legally specified? What is the share of general education as % of classroom/off-the-job instruction?	Not on a federal or state level In some cases, apprenticeship programmes provide the opportunity to simultaneously pursue secondary and post-secondary degrees	n/a (see above, II.1)
3. Specific mandatory educational contents	Are there legally specified standards regarding the content of the classroom instruction segment?	Not on a federal or state level	Generally, education programmes and contents are chosen by local boards of trustees and school executives (Sect. 78015 CAEC; Sect. 115D-20.4 NCGS) The selection of education programmes is strongly driven by local labour market needs; e.g. in CA,

			every two years CABOTs must evaluate whether educational programmes offered by a community college meet a documented labour market demand and are no unnecessary duplication of a similar programme in the area (Sect. 78015.a.1, 78015.b CAEC)
III. Regulation of work-based training			
1. Relevant bodies	Who has the competency to regulate the content of the work-based training segments?	LAACs upon agreement with the programme sponsor (apprenticeship standards including curricula for instruction; Sect. 3074 CALC; 94-5.c NSGS); assistance by and registration with CADAS/NCATBD (Sect. 3073 CALC)	n/a (see above, II.1)
2. Required off-the-job instruction *in* the company	Is the share of off-the-job instruction time *in* the company (i.e. the time the student/apprentice spends in the company, but not in productive work, e.g. on company-owned training facilities) legally specified?	No However, apprenticeship standards (see above, III.1) may define processes of the trade to be learnt and number of hours spent learning each process	n/a (see above, II.1)
3. Mandatory representation of:	Are the following three groups involved in the decision-making process about the content of work-based training?		
a. Employers		n/a (cf. the composition of LAACs above, I.4.a)	n/a (see above, II.1)
b. Employees		dito	n/a (see above, II.1)
c. Vocational teachers		dito	n/a (see above, II.1)
4. Statuary powers	Is the aforementioned body (see above, III.1) competent to:		

a. Trainee certification	- hand out training certifications to students/apprentices ?	No The certificates are typically handed out by the responsible departments (see above, I.3)	n/a (see above, II.1)
b. Validation of employer sponsorship	- validate employer sponsorship (i.e. verify if possible new training companies meet the necessary standards)?	No Sponsorship is validated by CADAS/NCATB (cf. e.g. Sect. 3073.1.a CALC)	n/a (see above, II.1)
IV. Financial attributes			
1. Public subsidies	Is there public funding for:		
a. Classroom instruction?		Yes In CA, excess costs incurred by local public education agencies exceeding state apportionments and local revenue earned by the attendance of apprentices are generally payable by the programme sponsor (Sect. 3074 CALC)	Yes (regarding the financial involvement of the federal government, cf. the summary)
b. workplace training?		No federally established incentives for employers to hire apprentices Some states, however, offer tax credits to employers or tuition fee benefits (e.g. CA)	n/a (see above, II.1)
2. Cost redistribution among employers	Is there an instrument of mandatory levy-grant finance to redistribute the costs of on-the-job training among employers?	Yes, in some states In CA, e.g., the State Board of Education and the Board of Governors of the California Community Colleges, and the CADAS jointly issue regulations regarding calculation and payment provision of excess costs to be borne by the programme sponsor (Sect. 3074 CALC); also, employers might, through collective bargaining, pay into apprenticeship funds, which hire coordinators to supervise the training in a given trade, process apprentice applications, etc.	n/a (see above, II.1)

3. Regulation of VET students' salaries	How are VET students' salaries/salary scales determined?	Principally, wages are determined contractually (Sect. 3078.f CALC; Sect. 94-7.6 NCGS) However, federal law mandates that apprentices receive the federal minimum wage Also, CACAC and, sometimes, LAACs may issue rules regarding minimum wages (Sect. 3071, 3076 CALC; Sect. 94-5.c NCGS) Partially, there are collective bargaining agreements including apprentices (cf. e.g. Sect. 3093 CALC) Generally, apprentices start at 35-50% of the skilled worker's wage and receive increases every six months	n/a (see above, II.1)
V. Education of VET teachers			
1. Regulation of VET teachers' education	Is there regulation on the education of VET teachers?	Mostly only on a local level Selection and training of teachers through state and local school boards responsible for VET and through community colleges upon agreement with the programme sponsor (Sect. 3074 CALC; Sect. 94-4 NCGS)	Yes, on the state level
2. Existence of minimal requirements	Does regulation stipulate minimal requirements regarding the education of VET teachers?	n/a	Yes CABOG/NCBCC adopt regulations to establish minimum qualifications for faculty members (after consultation with faculty representatives; cf. e.g. Sect. 115D-5.a NCGS)

References (Appendix B)

VET-specific Statutory Sources

USNAC, National Apprenticeship Act (1937). Retrieved from: http://www.doleta.gov/oa/history.cfm#amendments.

CALC, California Labor Code, Division 3, Chapter 4: Shelley-Maloney Apprentice Labor Standards Act (1939). Retrieved from: http://www.leginfo.ca.gov/cgi-bin/displaycode?section=lab&group=03001-04000&file=3070-3098.

CAEC, California Education Code, Division 7: Walter Stiern Act. Retrieved from: http://www.leginfo.ca.gov/cgi-bin/calawquery?codesection=edc.

NCGS, North Carolina General Statutes, Chapter 94: Apprenticeship. Retrieved from: http://law.justia.com/codes/north-carolina/2013/chapter-94.

NCGS, North Carolina General Statutes, Chapter 115D: Community Colleges. Retrieved from: http://www.ncga.state.nc.us/gascripts/statutes/StatutesTOC.pl?Chapter=0115D.

Secondary Sources (not all referred to above)

Boesel, D. (2012). Governing VET in the United States: Localization Versus Centralization. In: Barabasch, A. and Rauner, F. (eds.). Work and Education in America: The Art of Integration. Dordrecht et al.: Springer.

Dowd, A. C., Shieh, L. T. (2013). Community College Financing: Equity, Efficiency, and Accountability. In: The NEA 2013 Almanac of Higher Education.

Lerman R. I. (2014). Proposal 7: Expanding Apprenticeship Opportunities in the United States. American University and Urban Institute. Retrieved from: http://www.brookings.edu/~/media/research/files/papers/2014/06/19_hamilton_policies_addressing_poverty/expand_apprenticeships_united_states_lerman.pdf.

Lerman, R. I. (2009). Training Tomorrow's Workforce: Community College and Apprenticeship as Collaborative Routes to Rewarding Careers. Washington, DC: Center for American Progress.

Meeder, H. (2008). The Perkins Act of 2006: Connecting Career and Technical Education with the College and Career Readiness Agenda. Washington, D.C.: Archive Policy Brief.

OECD (2013). OECD Reviews of Vocational Education and Training – A Skills Beyond School Review of the United States. Paris: OECD Publishing.

U.S. Department of Education (2012). U.S. Background Information Prepared for the OECD Postsecondary Vocational Education and Training “Skills Beyond School” Study. Washington, D.C.: Department of Education.