



What does the decline in the international ranking of the United States in educational attainment mean for community colleges?

Michael Skolnik

To cite this article: Michael Skolnik (2016) What does the decline in the international ranking of the United States in educational attainment mean for community colleges?, Community College Journal of Research and Practice, 40:4, 310-326, DOI: [10.1080/10668926.2015.1113148](https://doi.org/10.1080/10668926.2015.1113148)

To link to this article: <http://dx.doi.org/10.1080/10668926.2015.1113148>



Published online: 26 Jan 2016.



Submit your article to this journal [↗](#)



Article views: 56



View related articles [↗](#)



View Crossmark data [↗](#)

What does the decline in the international ranking of the United States in educational attainment mean for community colleges?

Michael Skolnik

Department of Leadership, Higher and Adult Education, University of Toronto, Toronto, Ontario, Canada

ABSTRACT

This article was written in response to concerns that have been expressed about the possible consequences of an increasing number of countries overtaking the United States in educational attainment. International statistics on educational attainment were analyzed, questions about comparability of data were discussed, and the impact of different approaches to the organization of higher education on attainment rates was examined. The author concluded that comparing the rate of attainment of subbaccalaureate credentials between the United States and other countries is problematic both because of definitional issues, and as a consequence of the major transfer function of American community colleges. The article explains how colleges that previously offered short term vocational training in many European countries have evolved into vocationally-oriented baccalaureate granting institutions that have enabled their nations to achieve rapidly rising levels of baccalaureate degree attainment. It suggests that the experience of these countries may provide useful lessons—and cautions—for policy makers and educational leaders with respect to expanding the role of community colleges in awarding baccalaureate degrees.

In recent years, considerable concern has been voiced in the United States about the decline in its international ranking in educational attainment (Bernstein, 2013; College Board, 2008; Gentile, 2010; Gordon, 2013; Lewin, 2010; Lumina Foundation, 2015a, 2015b; Pell Institute, 2011; Will, 2014). Hauptman (2013) suggested that during the past decade how the United States compares to other Organization for Economic Co-operation and Development (OECD) countries in the percentage of the population that has attained a college degree “has come to dominate the higher education debate” in the country (p. 24). A major reason for the interest in the relative position of the United States in these rankings is the presumed connection between educational attainment and economic competitiveness in an increasingly globalized marketplace. As a 2011 report by the Pell Institute for the Study of Economic Opportunity explained, “many believe that the nation’s standing and competitiveness is being jeopardized as numerous countries begin and continue to surpass the United States in degree attainment” (p. 1).

In 2012, the United States was tied for 12th among OECD nations in the proportion of the population aged 25–34 that had attained at least a baccalaureate degree (OECD, 2014a), whereas just 10 years earlier it had ranked first (OECD, 2004). In reaction to this decline, many educational and political leaders have urged that the United States adopt the goal of substantially increasing its rate of educational attainment, if not restoring its world leadership in that indicator. In his first joint address to Congress, President Obama set a goal “that the nation should once again have the highest proportion of college graduates in the world by the year 2020” (U.S. Department of Education, 2011, p. 1).

This article discusses the implications of international comparisons of educational attainment for American community colleges. The article begins by probing deeper into the statistics from which some observers have drawn conclusions about the state of American higher education. It identifies some problems of international comparability, particularly for subbaccalaureate credentials, and it critiques some uses that have been made of the statistics. The section after that one identifies two developments that could impact comparisons of baccalaureate degree attainment rates: changes in the requirements for a baccalaureate degree in Bologna countries, and changes in the organization of higher education in some countries. In elaboration in the second of those developments, the following section compares the American and European models for facilitating baccalaureate degree attainment for students who begin postsecondary education in a career-focused program. The section notes the role that a baccalaureate granting sector composed of career-focused institutions has played in boosting baccalaureate degree attainment rates in Europe, and it describes how the reliance on transfer in the American model may have a depressing effect on its subbaccalaureate attainment rate. The concluding section comments briefly on the significance of the decline in the ranking of the United States in educational attainment, and it summarizes key implications of international comparisons of rates of educational attainment for community colleges.

International comparisons of educational attainment

The principal data source for international comparisons of educational attainment is the OECD annual publication, *Education at a glance*, which regularly contains a section on educational attainment statistics. The OECD data on postsecondary educational attainment differentiate between two categories: “Tertiary-type A or advanced research programs” (referred to here as Tertiary A), and “Tertiary-type B” (referred to here as Tertiary B) (OECD, 2014a). One of the major distinctions between these two categories is that Tertiary A programs are expected to have a more theoretical orientation and Tertiary B programs a more applied orientation. The basis for this distinction is the *International Standard Classification of Education 1997*, known as ISCED 1997 (UNESCO, 2006). According to the ISCED 1997, first stage Tertiary A programs are “largely theoretically based and are intended to provide sufficient qualifications for gaining entry into advanced research programs and professions with high skill requirements” (UNESCO, 2006, p. 35). In contrast, the ISCED 1997 defines a Tertiary B program as “practically oriented” and “occupationally specific,” being “mainly designed for participants to acquire practical skills and know-how needed for employment in a particular occupation or trade or class of occupations or trades” (UNESCO, 2006, p. 36).

However, other considerations, such as program duration, also go into classifying programs (OECD, 1999). Graduates of Tertiary A programs normally earn a baccalaureate or higher degree, and graduates of Tertiary B programs earn a different credential such as an associate degree, a diploma, or a certificate. Academic associate degree programs create a conundrum for statisticians. This is because they have the theoretical orientation of a Tertiary A program but the duration of a Tertiary B program. As a compromise, these programs are classified as Tertiary A for purposes of enrollment statistics, but their graduates are counted in the Tertiary B educational attainment statistics. Graduation from a baccalaureate program is treated as Tertiary A attainment regardless of the orientation of the program.

Because the principal Tertiary B credential in the United States is an associate degree, the tendency in the United States is to refer to Tertiary B as a “subbaccalaureate” credential (Hauptman, 2013). However, some regard the applied orientation of many Tertiary B programs as being so different from the more theoretical orientation of Tertiary A programs that the programs cannot be hierarchically ordered on a single scale. For this reason, in Canada, the term subbaccalaureate is not used when referring to Tertiary B diploma programs. Because this article is intended for a mainly American audience, the term subbaccalaureate will be used for convenience of exposition when referring to Tertiary B programs.

Table 1. Percentage of the population aged 25–64 that has attained tertiary education, OECD countries in 2002 and 2012.

	2002			2012		
	Tertiary B	Tertiary A	Total %	Tertiary B	Tertiary A	Total %
Australia	11	20	31	11	30	41
Austria	7	7	14	7	13	20
Belgium	15	13	28	17	18	35
Canada	22	21	43	25	28	53
Denmark	5	23	28	6	29	35
Finland	17	16	33	13	26	40
France	12	12	24	12	19	31
Germany	10	13	23	11	17	28
Greece	6	13	19	9	18	27
Iceland	6	20	26	4	31	35
Ireland	10	16	26	15	25	40
Japan	16	20	36	20	26	47
Korea	8	18	26	13	28	42
Luxembourg	7	12	19	13	26	39
Mexico	3	2	5	1	17	18
Netherlands	3	22	25	3	32	34
New Zealand	15	15	30	15	25	41
Norway	3	28	31	2	36	39
Slovak Rep.	1	10	11	1	18	19
Spain	7	17	24	10	23	32
Sweden	15	16	31	9	27	36
Switzerland	9	16	25	11	26	37
U.K.	8	19	27	10	31	41
USA	9	29	38	10	33	43

Note. Tertiary A stands for Tertiary A or advanced research programs; Total percentages for Tertiary A + Tertiary B may be affected by rounding. Source: (OECD, 2004, 2014a).

Before noting some of the definitional problems with these categories of educational attainment, a comparison of the basic data for 2002 and 2012 is presented in Table 1. Table 1 shows the percentages of the population aged 25–64 in 2002 and 2012 whose highest level of education was Tertiary B or Tertiary A, and the total for the two categories, for the OECD countries for which data were available for both years. The table shows that the United States ranked second only to Canada in total tertiary attainment in 2002, and it was exceeded by only Canada and Japan in 2012. In regard to Tertiary A attainment, the United States was first in 2002, and surpassed only by Norway in 2012.

The table shows that the percentage of persons whose highest credential is a baccalaureate or higher degree almost always exceeded the percentage whose highest level of attainment is a subbaccalaureate credential, often by a very large margin—as high as 17:1. The only cases where the figure for Tertiary B exceeded that for Tertiary A were Belgium, Canada, Finland, and Mexico in 2002. In that year, the figures were the same for both categories for Austria, France, and New Zealand. Given the prominence of community colleges in the United States, it may seem surprising that the ranking of the United States is so low for attainment of a subbaccalaureate credential, tied for 11th in 2002 and tied for 13th in 2012.

There are a few factors that serve to make the Tertiary B attainment rate for the United States an inaccurate reflection of the impact of 2-year institutions. For one thing, it is important to bear in mind that not everyone who has attained a subbaccalaureate credential is counted in the Tertiary B attainment rate. The educational attainment rate pertains only to the highest academic credential that a person has attained. Thus, a graduate of an associate degree program who subsequently obtains a baccalaureate degree would be counted only in the Tertiary A attainment category. The difference between the percentage of the population that has earned a subbaccalaureate credential and the percentage that is reported in the Tertiary B attainment category is probably greater for the United States than for most other countries because of the highly developed system of transfer in the United States. In many countries, transfer between different sectors of postsecondary education systems is neither mandated nor a common phenomenon.

In addition, the transfer system in the United States may exert a negative influence on the rate of attainment of subbaccalaureate credentials in another way: by diminishing the incentive to complete all the course work that is required for an associate degree before transferring to a 4-year institution. The National Student Clearinghouse Research Center found that for every 100 students with a 2-year degree or certificate who transferred from a 2-year to a 4-year institution in 2005–2006 in the United States, 177 students who did not possess a 2-year degree or certificate also transferred (Shapiro et al., 2013, p. 20). Because the baccalaureate degree completion rate was 28% higher for those who transferred with a 2-year degree or certificate than for those without, the tendency of students to transfer before completing an associate degree also affects the total tertiary attainment rate.

International comparisons of attainment of subbaccalaureate credentials are fraught with other definitional and measurement problems as well. A major source of these problems is the difficulty of distinguishing between tertiary and nontertiary education. It has been suggested that part of the reason for Canada's high ranking in the attainment of subbaccalaureate credentials is that some vocational training in Canada's community colleges that is treated as tertiary education would not be so regarded in many other countries (OECD, 2012). Another problem with the Canadian figures arises from the unique structure of the educational system in Canada's second largest province, Québec. The secondary school system in Québec ends with Grade 11; thus, a graduate of a 2-year program in a community college might be viewed as having completed only 1 year of tertiary education in comparison with peers in other jurisdictions who would have completed 2 years of tertiary education. After comparing Canadian data on subbaccalaureate attainment with that of other countries, Norrie and Lin (2009) expressed scepticism about the value of such international comparisons, and they reported that "most observers feel that international comparisons of these data are not meaningful" (p. 8). To take another example, in Korea qualifications in hairdressing and coffee shop baristas are treated as tertiary; whereas this would not be the case in the United States (Kuczera & Field, 2013).

An OECD study of vocational education in the United States noted also that while short-cycle certificates and industry certifications are not normally included in counts of tertiary qualifications in the United States for international comparison purposes, they do tend to be included in countries where such certifications are more regulated than they are in the United States (Kuczera & Field, 2013). The study suggested that this omission is a major problem for the United States because "as many as 65 million people in the U.S. workforce may either have such certifications or the closely associated licenses to practice" (Kuczera & Field, 2013, p. 16). A study by the Georgetown University Center on Education and the Workforce noted that while only 2% of adults aged 18 and older had a certificate as their highest educational credential in 1984, that figure had grown to 12% by 2009 (Carnevale, Rose, & Hanson, 2012).

Recent trends in the rate of baccalaureate degree attainment

Perhaps for the reasons outlined at the end of the previous section, more attention should be given to international comparisons of attainment of baccalaureate or higher degrees than to those on attainment of subbaccalaureate credentials. Rather than concentrating on the attainment rate for the total working age population, some have urged focusing on the youngest age cohort. This is because, as the Lumina Foundation suggested, the degree attainment rate of young adults may be "the best leading indicator of what will happen to the overall attainment rates in the future" (Lumina Foundation, 2015a, p. 2).

The 2014 edition of *Education at a glance* showed that in 2012 the United States still had the highest Tertiary A attainment rate for the 55–64 age group; and it had the second highest in the 45–54 age group, trailing Norway by one percentage point (OECD, 2014a, p. 44). In the 35–44 age group, the United States was tied with the United Kingdom for fifth, had a rate of 6 percentage points below that of Norway, but the U.S. was only a percentage point or two below the other three countries that had higher rates—Iceland, Israel, and Korea. It was only for the youngest age group,

25–34 year olds, that there was much daylight between the United States and other countries. It was tied for 12th, and was five or more percentage points behind Norway, Poland, Korea, Netherlands, the United Kingdom, and Finland.

While it is perhaps noteworthy that the attainment rates of successive cohorts showed greater increases for most other countries than they do for the United States, some commentators have cautioned about attempting to draw inferences about trends from comparisons among different age groups at a single point in time (Fry & Parker, 2012; Hauptman, 2013). The reason for this concern can be seen by comparing the attainment rates for the baccalaureate or higher degree for the United States for the age groups 25–34 and 35–44 in 2012. In that year the rate for the 25–34 age group was 34%, and the rate for the 35–44 age group was 35%. Because a 35-year-old in 2012 would have been 25 in 2002, one might be tempted to infer the trend in attainment rate for the 25–34 age group over this decade from the figures for the two age groups in 2012. This comparison would suggest that the rate for the 25–34 age group declined over the period, from 35 to 34. However, the actual rate for the 25–34 age group in 2002 was 31 (OECD, 2004). Thus, instead of a decline between 2002 and 2012, the attainment rate for this age group actually increased by 9%. The problem with inferring trends from cross-section data at a single point in time is that “the educational levels of any particular age group change as they age” (Fry & Parker, 2012, p. 16).

While the baccalaureate attainment rate for the United States has not been declining, it has nevertheless been increasing much more slowly than in most other countries. Of 30 OECD countries for which data were available for both years, the 9% increase in the attainment rate of the United States for the 25–34 age group between 2002 and 2012 exceeded the rate for only one country, Spain, which had an 8% increase. These rates of increase pale in comparison to the rates of increase for some of the countries that had higher attainment rates than the United States such as Finland, 86%; Netherlands, 60%; and Korea, 59%. It is perhaps noteworthy though that some of the countries that had large increases in their attainment rate for 25–34-year-olds during the first decade of this century experienced substantial declines in the population of that age group, e.g., Korea, Japan, and the Netherlands (Hauptman, 2013). With a declining population, maintaining a constant level in the number of degrees produced would result in an increased attainment rate. However, as Hauptman noted, countries with high and increasing baccalaureate attainment rates combined with declines in the relevant age population might still experience shortages of highly educated workers.

Besides changes in the population base, other factors that could influence attainment rates are changes in the requirements for different degrees and changes in the organization of higher education. It is not likely a coincidence that some spectacular increases in baccalaureate degree attainment rates for young people have occurred in countries that implemented changes in their academic degree structures as part of the Bologna Process. Whereas in many European countries, the typical length of time to earn a baccalaureate degree prior to Bologna was 5, 6, or even 7 years, during the first decade of this century that time was reduced to 3 or 4 years. In these countries, academic bachelor’s degrees typically take 3 years, and professional or applied degrees 4 years, though some of the latter may take only 3 or 3.5 years. It is important to note that in countries that subscribe to the Bologna Accord, a 3-year baccalaureate degree constitutes 75% of the academic credits of a 4-year degree (180 European Credit Transfer and Accumulation System [ECTS] credits vs. 240 ECTS credits). However, in the United States, the relatively small number of what are called 3-year baccalaureate degrees involve the same number of academic credits as a 4-year baccalaureate degree, generally taken in an accelerated time frame (Bradley, Seidman, & Painchaud, 2012).

It is a thorny problem to determine whether a 3-year bachelor’s degree from, say a Norwegian university-college, is the equivalent of a 4-year bachelor’s degree from an American university. While graduate school admissions offices have been wrestling with this issue for several years, it is difficult to find comprehensive, up-to-date information on how they are dealing with applicants who have a 3-year undergraduate degree from a Bologna Accord country. A 2008 survey of 120 American universities conducted by the Institute of International Education showed that one third of

admissions offices treated the Bologna degrees as equivalent to an American undergraduate degree, one third handled such applications on a case-by-case basis, and the others either had no policy, did not treat the Bologna degrees as equivalent, or left the decision to individual departments (Institute of International Education, 2009).

Perhaps of even greater impact on attainment rates has been the adoption of a binary structure of higher education in many European countries. Until the last third of the 20th century, the higher education systems of most European countries consisted exclusively of traditional universities (Taylor, Ferreira, Machado, & Santiago, 2008). Beginning in the United Kingdom in the 1960s, and much later in some other countries, adult vocational training institutions were molded into a parallel sector of postsecondary education that awarded baccalaureate and, in some countries, higher degrees. Frequently in Europe, the new sectors were created by merging existing vocational institutions, many of which tended to be in specialized fields, dated back to the 19th century, and had their roots in guilds (Huisman, 2008). These institutions had an applied orientation both with respect to their mission of preparing graduates for jobs and careers, and with respect to their extensive use of hands-on learning in their teaching methods. They also emphasized teaching and had limited involvement in research; and they were intended to admit students from a wide variety of educational backgrounds, including those who had been streamed away from the university admission pathway in secondary school (Slantcheva-Durst, 2010). Besides producing graduates with the knowledge and skills needed by industry, another of the principal motivations for the establishment of applied sectors of higher education was that it was thought to be a less costly way of expanding opportunity to pursue higher education than adding or expanding universities.

Examples of applied sectors of higher education in Europe are *Fachhochschulen* in Germany, Austria, and Switzerland; *Hogescholen* in the Netherlands; Polytechnics in Finland; Institutes of Technology in Ireland; and University-Colleges in Denmark, Norway, and Flanders. In some countries, applied sector institutions offer programs in traditional regulated professions such as law and engineering. However, many of their baccalaureate programs are in fields that have titles that would not sound out of place in an American community college, e.g., Safety & Security Management, International Hospitality, Materials Processing Technology, Health Promotion, Community Sports Leadership, Information Technology, Web Development & Creative Media, and Transport Management.

Applied sectors of higher education in many European countries have come to account for substantial proportions—in some cases, the majority—of baccalaureate enrollment. These sectors enroll about two thirds of baccalaureate degree students in the Netherlands and about one third in Germany (Klump, de Boer, & Vossensteyn, 2014); over 60% in Finland (Statistics Finland, 2014a, 2014b); and 48% in Ireland (Higher Education Authority of Ireland, 2013).

A good example of the impact of a new type of provider of baccalaureate degrees was the 1992 merger of over 200 vocational institutions in Finland into 32 polytechnic institutes (Välilä & Neuvonen-Rauhala, 2008). In 2014, the polytechnics awarded 22,887 baccalaureate degrees (Statistics Finland, 2014a) compared to 13,640 by the universities (Statistics Finland, 2014b), thus helping to explain the enormous increase in the baccalaureate degree attainment rate for young people that occurred in Finland during the early 21st century, raising its international ranking from 14th to 6th. Finnish polytechnics have recently taken to calling themselves Universities of Applied Sciences, a name that has been growing in popularity among applied sector institutions in Europe. Institutions of this type from several European countries have formed an Association of Universities of Applied Sciences (<http://www.uasnet.eu/>). The development of applied sectors of higher education has enabled many European countries to substantially increase their baccalaureate degree attainment rates for young people. Some countries, such as Norway, the Netherlands, and Finland, now have among the highest rates in the world.

However, having a parallel sector of vocationally-oriented, baccalaureate-granting institutions increases only the potential for higher educational attainment, not necessarily the actual rate of attainment. This is borne out by the experience of Germany where the *Fachhochschulen* were the

earliest example of an applied sector of baccalaureate-granting institutions on the continent (preceded in Europe only by the polytechnics in England and Wales). In 2012, Germany's Tertiary A attainment rate for 25–34-year-olds was third from the bottom among 34 OECD countries. Given that half the entrants to the Fachhochschulen are from the preuniversity stream in the secondary school (Klumpp & Teichler, 2008), it is likely that the *Fachhochschulen* serve at least as much to take students who would otherwise attend university—but are attracted by the opportunity for vocationally-oriented education at the higher education level—as they do to open up postsecondary education to new populations of students. Such speculation aside, it is not clear whether Germany's relatively low Tertiary A attainment rate was more a result of demand-side or supply-side factors. Moreover, the experience of Korea and Japan (Kis & Park, 2012; Tsunoda & Iida, 2015) showed that it is possible for a country in which the organization of higher education is broadly similar to that of the United States, albeit with substantially smaller community college sectors, to have a much higher rate of tertiary educational attainment than the United States.

A possible downside of partitioning postsecondary education systems into parallel academic and applied baccalaureate degree awarding sectors is that some of the countries that have done so have very low Tertiary B attainment rates. The Tertiary B rate for 25–34-year-olds in Finland decreased from 19% in 2002 to 1% in 2012. Apparently, when the former vocational institutions were merged into the new polytechnics, the subbaccalaureate programs that these institutions had formerly offered were drastically reduced in scale or discontinued. The negligible attainment rate for Tertiary B education indicates that the programs that are offered by 210 providers of vocational education and training in Finland (Ministry of Education and Culture, 2013) are not generally at the postsecondary level.

A similar situation to that in Finland exists in the Netherlands where the main activity of the *Hogescholen* is the provision of programs at the bachelor's and master's levels, and the rate of attainment of a subbaccalaureate vocational credential for 25–34-year-olds in 2012 was only 3%. In spite of the extensive network of institutions of vocational training for secondary school students and adults, a recent OECD review concluded that the major weakness of vocational education and training in the Netherlands was insufficient provision of vocational education at the postsecondary level below the baccalaureate degree (Fazekas & Litjens, 2014). The reviewers expressed concern that there were insufficient opportunities for graduates of secondary school vocational programs to continue their education, and that the country was producing fewer graduates of short-cycle postsecondary vocational education than were needed by the economy. The report noted that while a pilot program for 2-year associate degrees had been introduced, after several years enrollment in bachelor degree programs remained about 100 times the enrollment in associate degree programs.

The United States does not have a baccalaureate granting sector of its public postsecondary education system that is comparable to the applied sectors that are so common in Europe. However, the role that the European sectors play is covered at least partially in two ways in the United States. First, as Cappelli (2015) noted, many mainstream universities offer very specific, occupational programs at the baccalaureate level such as the Bakery Science program at Kansas State University, the Turf and Turfgrass Management program at Ohio State University, and the Supply Chain Management program at Widner University (Cappelli, 2015). Second, the for-profit sector, which in 2013–2014 consisted of 761 4-year institutions (National Center for Education Statistics, 2014), focuses on producing job-ready graduates for specific occupations. Compared to the European institutions, however, the first of these options is rather limited and fragmented, and the second lacks the breadth and stature of a substantial, publicly funded sector of postsecondary education.

Because the binary systems of higher education that have been adopted in many European countries may have such an important impact on Tertiary A attainment rates in these countries, the way in which these systems differ from higher education systems in the United States is elaborated in the next section.

Contrasting the American and European models for facilitating the attainment of baccalaureate degrees in applied fields of study

A feature of the organization of higher education that appears to be nearly universal is the existence of a distinct tertiary sector that consists of institutions that have as their exclusive, or as one of their major mission(s), the provision of vocationally oriented, or applied, education at the postsecondary level. In many European countries, such as the Netherlands, Finland, Germany, Denmark, and Ireland, the applied sector offers programs only or mainly at the baccalaureate and higher levels; and it accounts for a substantial proportion, and in some cases the majority, of baccalaureate degrees awarded in the country. In these countries, the chief avenue for students who want to obtain a baccalaureate degree in an applied field is to enroll in a baccalaureate program in an applied sector institution. Applied sector institutions constitute a parallel degree-granting sector to the university sector. Not all European countries have such applied sectors, for example Italy does not. Some countries outside Europe, for example, New Zealand, have an applied sector of this kind. The author has not been able to find sufficiently detailed descriptions of the higher education systems of all OECD countries to determine which, if either, of the conceptual models described in this section best fit their approaches to facilitating baccalaureate degree attainment for students in career and technical education. Among the countries listed in Table 1, the ones that have applied postsecondary sectors of the kind described in this section include Austria, Belgium, Denmark, Finland, Germany, Ireland, Netherlands, New Zealand, Norway, and Switzerland. Because of the prominence of European countries in this list, this approach to facilitating baccalaureate degree attainment in applied fields of study could be called the European Model.

In many countries, the vocational orientation of the applied sector, and how it differs in that respect from the traditional university sector, has been spelled out in legislation or policy. For example, the act under which the *Fachhochschulen* in Austria were established states that the purpose of these institutions is to provide “higher education courses that serve to educate on a scientific basis for vocations” (Hackl, 2008, p. 28). In contrast, the purpose of the universities is to provide “research and research based teaching directed towards the advancement of knowledge and new approaches to the arts” (Hackl, 2008, p. 29). Klumpp and Teichler have noted some of the ways that the “strong applied emphasis” of the German *Fachhochschulen* is manifested: “Most teachers are professionally experienced outside higher education and research, the number of part-time teachers with professional experience is higher [than in the universities], the teachers emphasize application both in the substance and the modes of teaching, and a larger proportion of FH [Fachhochschule] students is professionally experienced and participates in internships during the course of study” (Klumpp & Teichler, 2008, p. 108). In some countries, the quality assurance standards for baccalaureate level education give explicit recognition of the difference in orientation between applied and academic sectors of higher education (Skolnik, 2015). For example, in Flanders, teaching in applied sector programs is to be “principally provided by staff who link the program to [the] professional practice.” In institutions with an academic orientation, teaching should be “principally provided by researchers who contribute to the development of the subject/discipline” (Accreditation Organization of the Netherlands and Flanders, 2005, p. 7).

In some ways, community colleges in the United States play a similar role as *Hogescholen* in the Netherlands, or Institutes of Technology in Ireland. Community colleges are the largest provider in the United States of vocationally oriented programs at the postsecondary level, and the provision of vocationally oriented education is their predominant function. In 2010–2011, 58% of associate degrees in the United States were in occupational programs (Cohen, Brawer, & Kisker, 2014, p. 314). However, community colleges differ from applied sector institutions in Europe in that community colleges offer their programs exclusively or predominantly at the subbaccalaureate level. More than half the students who enter postsecondary education in the United States commence their studies in a community college (National Center for Education Statistics, 2008), and about 80% of community college students say that their goal is to obtain a baccalaureate degree (Community

College Research Center, 2015). Even if the proportion of students whose goal is to obtain a baccalaureate degree is lower for students in career programs than for those in academic programs, there would still be a very large number of students in community college career programs who seek to obtain a baccalaureate degree. With few exceptions, in order to obtain a baccalaureate, these students must transfer to a 4-year institution.

In contrast to the European Model, the practice whereby students who are interested in career-focused education begin their studies in a 2-year institution and subsequently have to transfer to a 4-year institution in order to complete a baccalaureate degree could be referred to as the American Model because of its visibility and prominence in the United States. This model is found also in Canada, Japan, some other Asian countries, and some countries in the Middle East. The experience of England and Wales shows that it is possible for a system to change from one of these models to the other. The European Model actually originated with the 1965 decision of the United Kingdom government to establish a system of polytechnic institutions in England and Wales that were authorized to offer career-focused programs at the baccalaureate and higher degree levels (Pratt, 1997). However, in 1992, the polytechnics became universities, and the Further Education Colleges became the major providers of postsecondary vocational education; but unlike the former polytechnics, Further Education Colleges were restricted to subbaccalaureate awards, e.g., the Higher National Diploma and the Foundation Degree.

Whereas the European Model was the product of quite deliberate planning, the American Model came about largely as an accident of history. Even those who do not hold the practice of educational planning in high regard would probably not go so far as charging any planner with having said “I’ve got a great idea for how to provide career education at the baccalaureate level. We’ll have students start by taking 2 years of mostly specialized courses in one institution, and then we’ll force them to transfer to a very different type of institution which will have a very different culture, and probably won’t offer any programs that are directly related to the occupational field in which they concentrated at their first institution. Also we’ll plan it in such a way so that many will have to move to another city in order to transfer, and because of a lack of curriculum fit between the two institutions, it will take them more than 4 years to complete a baccalaureate degree.”

With the benefit of hindsight, we can see how the common approach to facilitating the attainment of baccalaureate degrees in career and technical fields in the United States (and Canada) came about. Until relatively late in the 20th century, the American community college had two major missions that were quite different from one another. One was to provide the first 2 years of university-parallel courses in arts & sciences that prepared students to transfer into the third year of an arts and sciences curriculum in a 4-year institution. The other was to provide 2 years of career-focused education in a relatively narrowly defined occupational field that prepared graduates for entering the workforce. Many of the courses that career education students took were in highly specialized subjects for which there were no corresponding courses in 4-year institutions. The dissonance in curriculum between junior and senior institutions didn’t matter because the career education students were headed for the workforce, not for further study in a 4-year institution.

By the 1980s the proportion of community college students who opted for the career education stream had increased considerably, and more educators were coming to the opinion that in many of the career fields for which community colleges offered 2-year programs, students might need to—or be required to—have more education than that. It was suggested that advances in occupation-specific knowledge and technology had made the baccalaureate degree a necessary, or at least preferable, qualification in several of the fields in which the colleges were offering career programs (Burning Glass Technologies, 2014; Townsend, Bragg, & Ruud, 2009; Walker & Floyd, 2005). A recent study of job postings revealed that 65% of postings for Executive Secretary and Executive Assistant positions contain a requirement for a bachelor’s degree, whereas only 19% of people currently employed in these positions have such a degree (Burning Glass Technologies, 2014). Some other types of jobs in which there have been similar trends in educational requirements are

credit checkers, insurance claims processing clerks, transportation managers, and construction supervisors (Burning Glass Technologies, 2014).

One way of enabling students in 2-year career education programs to continue their studies to a higher level would have been to allow the institutions that provided 2-year career programs to extend those programs to 4 years. As described earlier, this is what occurred in many European countries where institutions were not encumbered by a tradition of offering transfer programs. However, given the history and identity of American community colleges as transfer institutions (Levin, 2004), an alternative strategy was adopted instead. This was to apply the same process of transfer to the realm of career education that had been developed to enable students taking a 2-year program in the liberal arts & sciences to transfer to a university.

However, the extension of the transfer process from the arts and sciences to career education has proved quite problematic because of the differences between the two areas of study. These differences—and the consequent obstacles that face applied associate degree graduates who aspire toward a baccalaureate degree—have been well documented and described (Karandjeff & Schiorring, 2011; Townsend, 2002; Townsend et al., 2009), and they need not be restated here. In three decades of efforts to create efficient pathways from an applied associate degree in a community college to baccalaureate degree in a related field in a 4-year institution, some progress has been made; but this endeavor still has overtones of trying to force a square peg into a round hole. The basic problem is that while the curriculum of academic programs in 2-year institutions had been designed expressly for the purpose of facilitating transfer to a 4-year institution, this is not the case for career education programs. As was said about this problem in Canada, community college career programs were designed to prepare graduates for the workforce, and their curriculum tends not to mesh with the curriculum of 4-year institutions (Baker, 2002).

The limited amount of research that has been done that compares the experience of students in different kinds of associate degree programs suggested that the baccalaureate degree attainment rate is significantly lower for those in career-focused programs than for those in academic programs. As early as 1991, Grubb reported that the transfer rate for recipients of vocational associate degrees was less than half the rate for those who completed academic associate degrees (Grubb, 1991). He found great differences in the probability of completing a baccalaureate degree between those who started in a vocational program and those who started in an academic program.

A decade later, Townsend reported even greater differences in transfer rates between these two groups (Townsend, 2002). Her estimates of transfer rates for academic and vocational associate degree graduates, respectively, for four states in the mid -to-late 1990s were Missouri, 41% and 9%; Oregon, 55% and 11%; Texas, 36% and 6%; and Washington, 52% and 5%. That such differences might be inherent in this particular type of organization of higher education rather than being a uniquely American phenomenon is suggested by the experience of British Columbia, the Canadian province with the most well-developed transfer system. The corresponding figures for that province in 2003 were 41% for arts and sciences graduates and 8% for graduates of vocational programs (Association of Colleges of Applied Arts & Technology of Ontario, 2005). Similarly, Alfonso, Bailey, and Scott (2005) found that even after controlling for demographic, socioeconomic, educational background, and pathway variables, students in occupational programs were far less likely to transfer to a baccalaureate program and less likely to complete a baccalaureate degree than students in academic programs.

In addition to the barriers that any associate degree graduate may face, such as being place-bound, being confronted with inflexible class schedules, or lacking sufficient financial resources, graduates of occupational programs may have to deal with additional barriers. These include not being able to find a program in a near-by 4-year institution that is related to the field of their associate degree, “credit transfer policies that exclude technical credits, and restrictive articulation agreements that typically result in substantial credit loss” (Chase, 2011, p. 377). Chase noted that these kinds of barriers impact particularly on minority students because they tend to be disproportionately represented in career and technical programs (Chase, 2011).

An alternative to wrestling with the various barriers to transfer that began to appear in the late 1990s in the United States was for community colleges to extend some of their 2-year programs into 4-year programs and award baccalaureate degrees themselves (Floyd, Skolnik, & Walker, 2005). The motivation for the community college baccalaureate degree was not just frustration with the limitations of the transfer process, but that was certainly an important element in some jurisdictions. For example, a study of the introduction of the community college baccalaureate degree in Ontario found frustration with the limitations of the transfer process to be an important factor (Skolnik, 2008). In his pioneering writing about the community college baccalaureate degree in the United States, Walker, assigns an important role to barriers that community college students experience when trying to complete a baccalaureate degree in his explanation of the rationale for this development (Walker, 2005, p. 13). Walker and other proponents of the community college baccalaureate in the United States have also identified the same three rationales for the community college baccalaureate as motivated the development of a parallel sector of baccalaureate granting institutions in Europe: increasing access to the baccalaureate degree; producing graduates with the knowledge and skills that will contribute to economic growth and productivity; and offering programs at the baccalaureate level that are less costly than those of traditional universities.

Presently the scale of the community college baccalaureate in the United States is quite modest. As of 2013, 57 community colleges in 18 states had received approval to award baccalaureate degrees and in total offered 468 programs (Russell, 2013). Community colleges have moved the furthest toward becoming baccalaureate granting institutions in Florida where 23 of the 28 colleges offer in total 150 baccalaureate degree programs (Cunningham, 2015). In 2011, over 25 thousand students were enrolled in baccalaureate programs in the Florida college system. The reasons why the Florida college system was given a major role in providing baccalaureate programs were these: (a) in spite of a well-developed transfer system, the state was lagging behind most of the rest of the country in baccalaureate attainment; (b) there were critical shortages of workers in high demand areas for which a baccalaureate degree was needed; and (c) it was deemed that the colleges could provide the programs that were needed to expand access and meet workforce needs in an economical manner (Cunningham, 2015; Floyd & Falconetti, 2013; Furlong, 2005). Since Russell's review of the situation in 2013, four more states have authorized community colleges to award baccalaureate degrees; included is California where approval of a pilot program that allows 15 colleges to award baccalaureate degrees was given in January, 2015 (Asimov, 2015).

In the advocacy literature for the community college baccalaureate in the United States (and in Canada as well), scarcely any reference is ever made to the evolution of the institutions that provided subbaccalaureate vocational education in Europe. However, as the same arguments are being given as to why community colleges in the United States should award baccalaureate degrees as were given in many European countries for why vocational institutions should offer baccalaureate degrees there, it is tempting to describe this development in the United States as a move toward the "Europeanization" of American higher education. Of course, it is too early to tell if this movement will go as far in the United States as it has in Europe.

It is perhaps noteworthy that in 2014 a large vote was cast in favor of the benefits of the European Model when China's Ministry of Education announced its intention to effect a gradual transition to a dual postsecondary system. That system would consist of traditional universities on the one hand, and a new system of applied higher education institutions on the other (Sharma, 2014). According to Qiang Zha, an expert on Chinese higher education, the new institutions are intended to be similar to the *Fachhochschulen* in Germany (Sharma, 2014). However, rather than expanding the mandate of vocational colleges that offer programs at the subbaccalaureate level, as other jurisdictions that have adopted this model have done, China intends to come at this reform from the other direction, transforming at least half its existing public universities into applied higher education institutions that will produce technically trained graduates.

Implications and conclusions

The principal reactions of educators, commentators, and policy-makers to news of the decline in the international ranking of the United States in college degree attainment have been to express alarm over the trend and to muster resolve to reverse it. Understandable as these reactions may be, there are two other possible responses that, perhaps, should take precedence over these reactions. One is to determine whether this change in ranking actually does constitute a problem, and if so, what is the magnitude of the problem? The other is to see what might be learned by probing into the factors and conditions that underlie the attainment rate numbers of other countries. The first of these tasks raises questions about the relationship between a country's level of educational attainment and its productivity and economic competitiveness. These are devilishly complex questions, and attempting to provide answers to them is well beyond the scope of this article. However, we can offer some observations to help provide a perspective on this type of response to the attainment ranking data.

The idea that there is an urgent need for the United States to substantially increase its rate of attainment of postsecondary education credentials because other countries are overtaking it is rather paradoxical when productivity is higher in the United States than in almost all those other countries. For example, the three countries that in 2012 had rates of total tertiary attainment for the 25–64 age group that exceeded that of the United States—Canada, Japan, and Israel—all had levels of gross domestic product (GDP) per hour worked in 2013 that were well below that of the United States (OECD, 2015). Canada had the highest GDP per hour worked of the three, but its figure was 25% less than that of the United States. Of the 11 countries whose rate of attainment of a baccalaureate or higher degree for 25–34-year-olds exceeded that of the United States—Norway, Poland, Luxembourg, Korea, Netherlands, United Kingdom, Finland, Australia, Iceland, Denmark, and Japan—only Luxembourg and Norway had levels of GDP per hour worked that exceeded that of the United States. However, while productivity grew at an average annual rate of 0.3% in Norway and 0.9% in Luxembourg between 2001 and 2013, it grew by 1.6% in the United States (OECD.Stat, 2015).

The comparison with Canada is particularly interesting because the OECD figures show Canada to have the highest total rate of attainment of tertiary education among OECD countries, and Canadian researchers and policymakers have long had a fixation on the gap in per capita income and productivity between Canada and the United States. In 1966, a study by the Economic Council of Canada reported that gross national product (GNP) per capita was 25% lower in Canada than in the United States, and it attributed one third of this difference to the fact that the Canadian labor force was less educated than its American counterpart (Bertram, 1966). The median years of formal education in Canada were then about 2 years less than in the United States. By 2010, Canada had virtually closed the education gap, as the average number of years of formal education was 13.3 in the United States and 13.2 in Canada (OECD, 2014b). However, Canada's productivity relative to that of the United States, as measured by GDP per worker, declined from 72.4 in 1969 to 70.5 in 2014 (Centre for the Study of Living Standards, 2015). Between these two countries there was, thus, a negative correlation between the education differential and the productivity differential. This example lends support to Hauptman's contention that what matters more than where a nation's educational attainment rate stands in international comparisons is whether its educational institutions are turning out sufficient numbers of graduates with the levels and types of education that are needed (Hauptman, 2013). Among the relatively few studies that have focused specifically on this question, opinion is somewhat divided.

Hauptman noted that many of the countries that are overtaking the United States in attainment rates have much lower birth rates and levels of immigration than the United States. And he also noted that differences between the United States and other countries in demographic trends may be as important, or even more important, than differences in attainment rates (Hauptman, 2013). He pointed out that the absolute number of 25–34-year-olds in the United States with a college degree is likely to grow from 18.1 million to 22.4 million, an increase of 24%, between 2010 and 2020

(Hauptman, 2013, p. 30), which may be a larger rate of increase than for some countries with higher attainment rates.

In regard to the labor demand side, a widely publicized projection study by the Georgetown University Center on Education and the Workforce (Carnevale, Smith, & Strohl, 2010) predicted that nearly two thirds of the jobs created by 2018 in the United States would require a college degree, about half of them at the subbaccalaureate level and half at the baccalaureate or higher degree level. These demand projections would imply a shortfall of about 3 million college graduates (Carnevale et al., 2010). Indicative of how widely cited the Georgetown projections have become, it is worth noting that they were used in the 2013 OECD review of vocational education in the United States to indicate the scale of the need for subbaccalaureate level vocational education in the country (Kuczera & Field, 2013).

In spite of how widely cited these projections may be, they are not without their critics. The Georgetown projections differ substantially from those of the Bureau of Labor Statistics (BLS), and some critics have argued that the projections dramatically overestimate the number of college graduates that will be needed by the economy (Harrington & Sum, 2010). Among their criticisms, Harrington and Sum noted that the Georgetown projections exclude the possibility of underemployment, which according to some critics is rampant. Cappelli suggested that the average worker in the United States has about 30% more education than their job requires and that this figure has been rising (Cappelli, 2015).

Although Neumark, Johnson, and Mejia (2013) expressed some concerns about the data used by the BLS, they did not concur with the Georgetown projections of large national skill shortages in the near term, a finding that they judged to be “unfounded” (Neumark et al., 2013, p. 165). However Neumark et al. suggested that based on recent trends, some shortages of educated workers could develop in the longer term as baby boomers retired; and they cautioned that some shortages could develop sooner in a few states (particularly California, Florida, and Texas) and perhaps in some specific occupations (Neumark et al., 2013).

When we probed into the factors that underlie the comparative figures on educational attainment, we discovered problems of comparability between the measured rates for different countries, particularly with respect to attainment of subbaccalaureate credentials. We noted earlier the conclusion of Norrie and Lin (2009) that these comparisons were not very meaningful because of international differences in what was counted as postsecondary subbaccalaureate education.

Another concern is that the context for figures on the attainment of a subbaccalaureate credential is quite different in a country like the United States in which there are well-developed arrangements for moving up the ladder from a subbaccalaureate credential to the attainment of a baccalaureate degree than in countries which do not have such arrangements. In countries of the latter type, the attainment rate of subbaccalaureate credentials might be taken as an indicator of the performance of the institutions that award subbaccalaureate credentials. However, in a country where more students start postsecondary education in 2-year than in 4-institutions, the interdependence between the associate degree and the baccalaureate degree limit the usefulness of the rate of attainment of an associate degree as a performance indicator for institutions whose main mission is to provide education to the associate degree level. If the goal of 80% of students who enter associate degree programs is to attain a baccalaureate degree, then it might be argued that the performance of the community college sector would be inversely related to the proportion of entrants to associate degree programs whose highest academic credential years later is an associate degree. At any rate, there are sufficient problems surrounding international comparisons of attainment of subbaccalaureate credentials to call into question the usefulness of formulating a national target for the combined rate of subbaccalaureate and baccalaureate degree attainment.

When focusing on the baccalaureate degree attainment rate, something that stands out in international comparisons is the important role that having a substantial public sector of vocationally oriented postsecondary institutions plays in many countries that have high and/or rapidly increasing rates of attainment, particularly in European countries such as Norway, Netherlands,

Finland, and Denmark. Although a few countries that employ the American model, notably Korea and Japan, seem to be doing quite well in educational attainment, the European model has helped many countries increase their rates of educational attainment. Directing attention to the role that parallel sectors of vocationally-oriented, baccalaureate granting institutions play in many countries, and how they perform this function, may be helpful to community college leaders who want to make a case for their institutions to award baccalaureate degrees or to gain approval to increase the scale of their baccalaureate programs.

American community colleges attract many vocationally-oriented students who do not feel ready for, or may not be as likely to be admitted directly to, a 4-year institution. Therefore, it is quite possible that a higher proportion of these students would be able to obtain a baccalaureate degree if they could do a 4-year program wholly within the environment of a community college that has become familiar to them than are able to survive the transfer route. If this were indeed to be the case, then increasing the prevalence of the community college baccalaureate degree might be a very effective way of boosting the Tertiary A attainment rate of the United States.

One of the main criticisms of the idea of community colleges awarding baccalaureate degrees is that doing so might divert attention and resources from their more traditional activities (Townsend, 2005). The extraordinary decline in the rate of attainment of postsecondary vocational credentials at the subbaccalaureate level when Finland reorganized its vocational colleges into baccalaureate granting polytechnic institutes provides a reason for taking this concern seriously. However, a study in British Columbia, which was the first of any Canadian province or American state where community colleges added the awarding of baccalaureate degrees to their mission, showed that enrollment in subbaccalaureate programs remained stable or increased as community colleges expanded their offerings of baccalaureate programs (Fleming & Lee, 2009). The majority of Canada's provinces now allow community colleges to award baccalaureate degrees (Weinrib & Jones, 2014), and Canada's Tertiary B attainment rate has increased apace with the expansion of baccalaureate programming in its community colleges. Though vigilance to this issue is appropriate, given the range and depth of involvement of American community colleges in offering programs at the subbaccalaureate level, it is hard to see how that area of activity could be hurt significantly by a modest expansion of baccalaureate programming.

References

- Accreditation Organization of the Netherlands and Flanders (NVAO). (2005). *Accreditation framework: Flanders*. The Hague, Netherlands: NVAO. Retrieved from http://nvaio.com/page/downloads/NVAO_-_Accreditation_framework-FL.pdf
- Alfonso, M., Bailey, T. R., & Scott, M. (2005). The educational outcomes of occupational sub-baccalaureate students: Evidence from the 1990s. *Economics of Education Review*, 24, 197–212. doi:10.1016/j.econedurev.2004.02.003
- Asimov, N. (2015, January 20). 15 state community colleges get OK to offer bachelor's degrees. *SF Gate*. Retrieved from <http://www.sfgate.com/bayarea/article/15-California-community-colleges-get-OK-to-offer-6028368.php>
- Association of Colleges of Applied Arts & Technology of Ontario. (2005). *Student mobility within Ontario's post-secondary sector*. Toronto, Ontario, Canada: Author.
- Baker, D. N. (2002, July). *On postsecondary quality assurance in Ontario: Introduction of the postsecondary education quality assessment board, 2001–02*. A presentation at the Fourth International Conference on Assessing Quality in Higher Education, Vienna, Austria.
- Bernstein, M. F. (2013, 7 October). Declining educational attainment. *Huffington Post*. Retrieved from http://www.huffingtonpost.com/marc-f-bernstein/declining-educational-att_b_3568548.html
- Bertram, G. W. (1966). *The contribution of education to economic growth*. Ottawa, Ontario, Canada: Economic Council of Canada.
- Bradley, M. J., Seidman, R. H., & Painchaud, S. R. (2012). *Saving higher education: The integrated, competency-based three-year bachelor's degree*. San Francisco, CA: Jossey-Bass.
- Burning Glass Technologies. (2014). *Moving the goalposts: How demand for a bachelor's degree is reshaping the American workforce*. Boston, MA: Author. Retrieved from http://burning-glass.com/wp-content/uploads/Moving_the_Goalposts.pdf

- Cappelli, P. (2015). *Will college pay off? A guide to the most important financial decision you'll ever make*. New York, NY: Public Affairs.
- Carnevale, A. P., Rose, S. J., & Hanson, A. R. (2012). *Certificates: Gateway to gainful employment and college degrees*. Washington, DC: Georgetown University Center on Education and the Workforce.
- Carnevale, A. P., Smith, N., & Strohl, J. (2010). *Help wanted: Projections of jobs and educational requirements through 2018*. Washington, DC: Georgetown University Center on Education and the Workforce.
- Centre for the Study of Living Standards. (2015, May 20). *Aggregate income and productivity trends: Canada vs. the U.S.* Ottawa, Ontario, Canada: Author. Retrieved from <http://www.csls.ca/data/ipt1.asp>
- Chase, M. (2011). Benchmarking equity in transfer policies for career and technical associate's degrees. *Community College Review*, 39(4), 376–404. doi:10.1177/0091552111423966
- Cohen, A. M., Brawer, F. B., & Kisker, C. B. (2014). *The American community college* (6th ed.). San Francisco, CA: Jossey-Bass.
- College Board. (2008). *Coming to our senses: Education and the American future*. New York, NY: Author.
- Community College Research Center. (2015). *What we know about transfer*. New York, NY: Teacher's College, Columbia University. Retrieved from <http://ccrc.tc.columbia.edu/media/k2/attachments/what-we-know-about-transfer.pdf>
- Cunningham, A. (2015). *Florida college system: Baccalaureate degree programs*. Tallahassee: Florida Department of Education. Retrieved from <http://www.accbd.org/wp-content/uploads/2010/08/Florida-College-System-Baccalaureate-Degree-Programs-by-Abbey-Cunningham.pdf>
- Fazekas, M., & Litjens, I. (2014). *A skills beyond school revDiew of the Netherlands*, OECD reviews of vocational education and training. Paris, France: OECD.
- Fleming, R., & Lee, G. R. (2009). Canada: What's in a title? In N. Garrod & B. Macfarlane (Eds.), *Challenging boundaries: Managing the integration of postsecondary education* (pp. 93–110). New York, NY: Routledge.
- Floyd, D. L., & Falconetti, A. M. G. (2013). The baccalaureate movement in Florida: A decade of change. In N. Remington & R. Remington (Eds.), *Alternative pathways to the baccalaureate* (pp. 85–107). Sterling, VA: Stylus.
- Floyd, D. L., Skolnik, M. L., & Walker, K. P. (Eds.). (2005). *The community college baccalaureate: Emerging trends and policy issues*. Sterling, VA: Stylus.
- Fry, R., & Parker, K. (2012). *Record shares of young adults have finished both high school and college*. Washington, DC: Pew Research Center on Social and Demographic Trends. Retrieved from <http://www.pewsocialtrends.org/2012/11/05/record-shares-of-young-adults-have-finished-both-high-school-and-college/>
- Furlong, T. E. (2005). St. Petersburg college: Increasing access in critical areas. In D. L. Floyd, M. L. Skolnik & K. P. Walker (Eds.), *The community college baccalaureate: Emerging trends and policy issues* (pp. 103–128). Sterling, VA: Stylus.
- Gentile, S. (2010). *U.S. lags behind rivals in college degrees, especially in the south*. Need to Know on PBS. Retrieved from <http://www.pbs.org/wnet/need-to-know/economy/u-s-lags-behind-its-rivals-in-college-degrees-especially-in-south/2765/>
- Gordon, R. J. (2013, September 7). The great stagnation of American education. *The New York Times*. Retrieved from http://opinionator.blogs.nytimes.com/2013/09/07/the-great-stagnation-of-american-education/?_php=true&_type=blogs&r=0
- Grubb, N. (1991). The decline of community college transfer rates: Evidence from national longitudinal surveys. *The Journal of Higher Education*, 62(2), 194–222. doi:10.2307/1982145
- Hackl, E. (2008). The role of the non-university sector in Austrian higher education. In J. S. Taylor, J. B. Ferreira, M. D. L. Machado & R. Santiago (Eds.), *Non-University higher education in Europe* (pp. 15–42). Dordrecht, Netherlands: Springer.
- Harrington, P. E., & Sum, A. M. (2010, November 8). College labor shortages in 2018?. In *New England board of higher education* (pp. 1–5). Boston, MA. Retrieved from <http://www.nebhe.org/thejournal/college-labor-shortages-in-2018/>
- Hauptman, A. M. (2013, May/June). U.S. attainment rates, demographics, and the supply of college graduates. *Change: The Magazine of Higher Learning*, 45(3), 24–33. doi:10.1080/00091383.2013.787012
- Higher Education Authority of Ireland. (2013). *Higher education key facts and figures 2011/12*. Dublin, Ireland: Author. Retrieved from http://www.heai.ie/sites/default/files/keyfactsfigures1112_0.pdf
- Huisman, J. (2008). Shifting boundaries in higher education: Dutch *Hogescholen* on the move. In J. S. Taylor, J. B. Ferreira, M. D. L. Machado & R. Santiago (Eds.), *Non-University higher education in Europe* (pp. 147–168). Dordrecht, Netherlands: Springer.
- Institute of International Education. (2009). *Three-year Bologna-compliant degrees: Responses from U.S. graduate schools*. New York, NY: Author. Retrieved from <file:///C:/Users/Mike%20Skolnik/Downloads/Three-Year-Bologna-Compliant-Degrees-US-Grad-Schl.pdf>
- Karandjef, K., & Schiorring, E. (2011). Career and technical education (CTE) transfer research project: Improving transfer pathways for California college students in CTE programs. *Journal of Applied Research in the Community College*, 18(2), 42–51.
- Kis, V., & Park, E. (2012). *A skills beyond school review of the United Korea*, OECD reviews of vocational education and training. Paris, France: OECD.

- Klumpp, M., de Boer, H., & Vossensteyn, H. (2014). Comparing national policies on institutional profiling in Germany and the Netherlands. *Comparative Education*, 50(2), 156–176. doi:10.1080/03050068.2013.834558
- Klumpp, M., & Teichler, U. (2008). German *Fachhochschulen*: Toward the end of a success story? In J. S. Taylor, J. B. Ferreira, M. D. L. Machado & R. Santiago (Eds.), *Non-University higher education in Europe* (pp. 99–122). Dordrecht, Netherlands: Springer.
- Kuczera, M., & Field, S. (2013). *A skills beyond school review of the United States, OECD reviews of vocational education and training*. Paris, France: OECD Publishing.
- Levin, J. S. (2004). The community college as a baccalaureate-granting institution. *The Review of Higher Education*, 28, 1–22. doi:10.1353/rhe.2004.0029
- Lewin, T. (2010, 23 July). Once a leader, U.S. lags in college degrees. *New York Times*. Retrieved from http://www.nytimes.com/2010/07/23/education/23college.html?_r=0
- Lumina Foundation. (2015a). *A stronger nation through higher education*. Indianapolis, IN: Author. Retrieved from http://www.luminafoundation.org/files/publications/A_stronger_nation_through_higher_education-2015.pdf
- Lumina Foundation. (2015b). *Goal 2025*. Indianapolis, IN: Author. Retrieved from http://www.luminafoundation.org/goal_2025
- Ministry of Education and Culture. (2013). *Vocational education and training: Administration and finance*. Helsinki, Finland: Author. Retrieved from http://www.minedu.fi/OPM/Koulutus/ammattilinen_koulutus/hallinto_ohjaus_ja_rahoitus/?lang=en
- National Center for Education Statistics. (2008). *Descriptive summary of 2003–04 beginning postsecondary students three years later*. Washington, DC: Author. Retrieved from <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2008174>
- National Center for Education Statistics. (2014). *Digest of education statistics 2013*. Washington, DC: Author. Retrieved from http://nces.ed.gov/programs/digest/d14/tables/dt14_317.20.asp
- Neumark, D., Johnson, H., & Mejia, M. C. (2013). Future skill shortages in the U.S. economy? *Economics of Education Review*, 32, 151–167. doi:10.1016/j.econedurev.2012.09.004
- Norrie, K., & Lin, S. (2009). *Postsecondary education attainment and participation in Ontario*. Toronto, Ontario, Canada: Higher Education Quality Council of Ontario.
- OECD. (1999). *Classifying educational programs: Manual for ISCED-97 implementation in OECD countries, 1999 edition*. Paris, France: Author.
- OECD. (2004). *Education at a glance 2004: OECD indicators*. Paris, France: Author.
- OECD. (2012). *OECD economic surveys: Canada 2012*. Paris, France: Author.
- OECD. (2014a). *Education at a glance 2014: OECD Indicators*. Paris, France: Author.
- OECD. (2014b). *Educational attainment by gender and average years spent in formal education*. Retrieved from http://www.oecd.org/els/family/CO_3_1_Educational_attainment_by_gender_Sep2014.pdf
- OECD. (2015). *OECD compendium of productivity indicators*. Retrieved from <http://www.oecd.org/std/productivity-stats/oecd-compendium-of-productivity-indicators-22252126.htm>
- OECD.Stat. (2015). *Growth in GDP per capita, productivity and unit labor costs*. Retrieved from http://stats.oecd.org/Index.aspx?DataSetCode=PDB_LV
- Pell Institute for the Study of Economic Opportunity. (2011). *Developing 20/20 vision on the 2020 degree attainment goal*. Washington, DC: Author. Retrieved from http://www.pellinstitute.org/downloads/publications-Developing_2020_Vision_May_2011.pdf
- Pratt, J. (1997). *The polytechnic experiment*. Buckingham, United Kingdom: The Society for Research into Higher Education & Open University Press.
- Russell, A. B. (2013). Update on the community college baccalaureate. In N. Remington & R. Remington (Eds.), *Alternative pathways to the baccalaureate* (pp. 67–84). Sterling, VA: Stylus .
- Shapiro, D., Dundar, A., Ziskin, M., Chiang, Y., Chen, J., Torres, V., & Harrell, A. (2013). *Baccalaureate attainment: A national view of the postsecondary outcomes of students who transfer from two-year to four-year institutions* (Signature Report No. 5). Herndon, VA: National Student Clearinghouse Research Center.
- Sharma, Y. (2014, June 12). China: Major reform as 600 universities become polytechnics. *University World News*. Retrieved from <http://www.universityworldnews.com/article.php?story=20140612080509913>
- Skolnik, M. L. (2008). Theorizing about the emergence of the community college Baccalaureate. *Community College Journal of Research and Practice*, 33(2), 125–150. doi:10.1080/10668920802564873
- Skolnik, M. L. (2015). How do quality assurance systems accommodate the differences between academic and applied higher education? *Higher Education*, 1–18. Advance online publication. doi:10.1007/s10734-015-9908-4
- Slantcheva-Durst, S. (2010). Chapter 1: Redefining short-cycle higher education across Europe: The challenges of Bologna. *Community College Review*, 38(2), 111–132. doi:10.1177/0091552110384610
- Statistics Finland. (2014a). *Completed polytechnic degrees by type of education, fields of education*. Retrieved from http://www.stat.fi/til/akop/2014/akop_2014_2015-04-16_tau_001_en.html
- Statistics Finland. (2014b). *Students in universities and completed university degrees by field of education*. Retrieved from http://www.stat.fi/til/yop/2014/yop_2014_2015-05-06_tau_001_en.html

- Taylor, J. S., Ferreira, J. B., Machado, M. D. L., & Santiago, R. (2008). *Non-University higher education in Europe*. Dordrecht, Netherlands: Springer.
- Townsend, B. K. (2002, April). *Terminal students do transfer*. A paper presented at the annual meeting of the American Association of Community Colleges, Seattle, Washington.
- Townsend, B. K. (2005). A cautionary view. In D. L. Floyd, M. L. Skolnik & K. P. Walker (Eds.), *The community college baccalaureate: Emerging trends and policy issues* (pp. 179–190). Sterling, VA: Stylus.
- Townsend, B. K., Bragg, D. D., & Ruud, C. M. (2009). Development of the applied baccalaureate. *Community College Journal of Research and Practice*, 33(9), 686–705. doi:10.1080/10668920902983601
- Tsunoda, J. S., & Iida, Y. (2015). Institutions in transition: Japan's community colleges. In P. A. Elsner, G. R. Boggs & J. T. Irwin (Eds.), *Global development of community colleges, technical colleges, and further education programs, revised edition* (pp. 155–176). Washington, DC: Community College Press.
- U.S. Department of Education. (2011). *Meeting the nation's 2020 goal: State targets for increasing the number and percentage of graduates with degrees*. Retrieved from <https://www2.ed.gov/policy/highered/guid/secletter/110323insert.pdf>
- UNESCO. (2006). *International standard classification of education 1997, 2006 re-edition*. Paris, France: Author.
- Välilmaa, J., & Neuvonen-Rauhala, M. (2008). Polytechnics in Finnish higher education. In J. S. Taylor, J. B. Ferreira, M. D. L. Machado & R. Santiago (Eds.), *Non-University higher education in Europe* (pp. 77–98). Dordrecht, Netherlands: Springer.
- Walker, K. P. (2005). History, rationale, and the community college baccalaureate association. In D. L. Floyd, M. L. Skolnik & K. P. Walker (Eds.), *The community college Baccalaureate: Emerging trends and policy issues* (pp. 9–24). Sterling, VA: Stylus.
- Walker, K. P., & Floyd, D. L. (2005). Applied and workforce baccalaureates. In D. L. Floyd, M. L. Skolnik & K. P. Walker (Eds.), *The community college Baccalaureate: emerging trends and policy issues* (pp. 95–102). Sterling, VA: Stylus.
- Weinrib, J., & Jones, G. A. (2014). Largely a matter of degrees: Quality assurance and Canadian universities. *Policy & Society: An Interdisciplinary Journal of Policy Research*, 33(3), 225–236. doi:10.1016/j.polsoc.2014.07.002
- Will, M. (2014, 16 September). U.S. trails in college graduation in global study. *Education Week*. Retrieved from <http://www.edweek.org/ew/articles/2014/09/17/04oecd.h34.html>