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Apples and Oranges in the Flat World:

A Layperson's Guide to International Comparisons of Postsecondary Education

Jane V. Wellman

American Council on Education
Center for Policy Analysis
Center for International Initiatives

American Council on Education

American Council on Education
One Dupont Circle NW
Washington, DC 20036

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Table of Contents

Foreword

In May 2001, the American Council on Education (ACE) convened a meeting to assess the current state of analysis of higher education policy issues. The purpose was to identify ways in which the needs of institutions, the interests of foundations, and the talents of scholars could be better aligned. Participants included higher education scholars, foundation executives, college and university presidents, and education policy analysts.

In particular, we were eager to learn how ACE could help make research on higher education more accessible and useful to institution leaders. Several participants suggested that ACE produce short publications that summarize the findings of important areas of higher education research. The ACE Center for Policy Analysis embraced that suggestion and created this series, *Informed Practice: Syntheses of Higher Education Research for Campus Leaders*. Reports in the series include *Access & Persistence: Findings from 10 Years of Longitudinal Research on Students*, which summarized major findings from a decade of federally funded longitudinal studies of college students; *Diversifying Campus Revenue Streams: Opportunities and Risks*, which described the emerging literature on the myriad ways that campuses are raising revenue and the issues and problems that leaders must confront as they consider such ventures; *The School-to-College Transition: Challenges and Prospects*, which reviewed the large body of research on access to college, focusing in particular on how campus and system leaders can help schools better prepare low-income and minority youth for success in higher education; and *Adult Learners in the United States: A National Profile*, which summarized what we know and—perhaps more importantly—don't know about this large and growing segment of the student population.

Our topic this year is international comparisons of postsecondary education. These comparisons are becoming increasingly common in public policy conversations. It has become typical for reports to warn that the United States is no longer number one in the world in terms of higher education. Perhaps precisely because we were consistently ranked first among nations, we in U.S. higher education did not question the nature of these statistics and consequently know little about them. This report, by noted policy analyst Jane V. Wellman, answers important questions about the most commonly cited statistics. What do they measure? How accurate are these statistics? And what do they tell us in broad terms about both U.S. performance and worldwide trends in postsecondary education?

We hope you will share this report with your staff and that it will spark useful conversations with your varied constituents. Additional copies are available for purchase on the ACE web site. We welcome your suggestions for areas of research that future essays should address and for ways we can make these documents more useful to you.

Jacqueline E. King
Director, Center for Policy Analysis

Madeleine F. Green
Vice President for International Initiatives

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Executive Summary

International comparisons provide helpful benchmarks against which to make judgments about the effectiveness of U.S. policy and performance. In this respect, they are a logical extension of the last decade's expanded interest in public accountability measures for higher education, although, at the international level, measures reflect aggregate national performance rather than institution- or state-level performance.

This paper is designed to be a layperson's primer on sources for and factors to consider in making sense of comparative performance measures of postsecondary education. It is not meant to present a comprehensive discussion about all aspects of international comparisons, nor does this paper diagnose the state of U.S. postsecondary performance in the world. Either of these topics could easily command long treatises. The material presented here is designed to give a short overview of some major headlines, with information about the issues underlying several of the measures.

The report discusses factors to consider in making sense of international comparisons, including data sources, definitions, and differences in degree or certificate structures and classification systems. Some of the more commonly cited indicators are presented, in the categories of educational performance (that is, measures by enrollment, retention, and attainment data); production of scientists and engineers; finances; spending on science and technology; student mobility and international enrollments; and international rankings of institutions. The report suggests questions to ask when working with the data (see Appendix A), and includes a listing of some of the major sources of international comparative data (see Appendix B).

Differences in terminology, educational systems, and degree structures make apples-to-apples comparisons in many areas problematic. Despite this, a good deal of progress has been made in recent years developing reporting formats that adjust for differences among countries and account for changes in reporting formats from year to year. This is particularly true for data on educational "performance," including participation and degree attainment. In other areas, there has been less progress; finance data, for instance, continue to be uneven. Taken as a whole, the comparisons are most useful in looking at relative changes in performance within each country over time to identify broad trends. When looked at this way, the major findings are:

- With respect to the proportion of adults who have completed any type of tertiary education, the United States has fallen from first among older adults to seventh among young adults (see Table 2). The difference in relative performance between older adults and young adults is largely attributable to growing educational attainment among young adults in other countries while U.S. performance has remained flat. As is the case with many of these comparisons, the wide variation in the types of educational experiences included in the subbaccalaureate category (for example, Canada includes those who have completed a vocational certificate or associate degree, while the United States includes only those who have earned an associate degree) means that the exact rank is less meaningful than the broad changes over time.

- The number of bachelor's degrees awarded in science and technology fields in the United States is rising, but not keeping pace with gains in other countries. U.S. baccalaureate-degree production in scientific and technological areas has increased steadily over the last 20 years, and reached all-time highs in 2002, with more than 400,000 degrees awarded. However, growth has been greatest in the social and behavioral sciences, rather than in the disciplines most correlated with research and development (R&D) in science and technology (see Table 5).
- Slightly less than one-third of all U.S. bachelor's degrees are awarded to students in science and engineering disciplines—a proportion that has remained quite stable for the last three decades. The corresponding figures for many other countries are considerably higher, led by Japan (64 percent), China (57 percent), and South Korea (47 percent) (NSB, 2006). As is the case with other comparisons, improved performance in other countries compared with stable performance in the United States means the relative U.S. share of science and engineering degree production has declined.
- The United States continues to award a disproportionate share of the world's doctorates in science and engineering relative to population, and doctoral-degree production in scientific and technological fields has grown modestly in the United States since 1980. However, most of the real growth has come from holders of temporary visas (see Table 8).
- The United States still leads the world in total spending for R&D at nearly US$285 billion in 2003, well ahead of the entire European Union (US$211 billion), Japan (US$114 billion), and China (US$85 billion) (OECD, 2005b). Nonetheless, as in other areas, the United States has slipped relative to other countries in R&D spending as a proportion of the gross domestic product (GDP)—a ratio known as a national measure of "research intensity." U.S. research intensity is now at 2.6 percent—still above the Organisation for Economic Co-operation and Development (OECD) average of 2.3 percent, but below R&D intensity in Sweden, Finland, Japan, and Iceland (OECD, 2005b).
- The United States leads all other countries at 22 percent of international student enrollment, but the U.S. share has declined since 2000 (see Table 10). Because countries count international students differently, international comparisons are potentially inconsistent, and recent changes in definitions in this area mean that the trend data may not reflect actual changes in performance.

Introduction: International Comparisons in the "Flat World"

International comparisons of postsecondary performance are becoming increasingly common in public policy conversations about U.S. higher education. In the last three years alone, there has been a spate of reports from national commissions, study groups, and research organizations, all using international comparisons to argue that U.S. higher education—long recognized as the world leader—is no longer the only game in town. For instance:

> *At a time when we need to be increasing the quality of learning outcomes and the economic value of a college education, there are disturbing signs that suggest we are moving in the opposite direction. As a result, the continued ability of American postsecondary institutions to produce informed and skilled citizens who are able to lead and compete in the 21st-century global marketplace may soon be in question.*
> –National Commission on the Future of Higher Education, 2006

> *Having reviewed trends in the United States and abroad, the Committee [on Prospering in the Global Economy of the 21st Century] is deeply concerned that the scientific and technological building blocks critical to our economic leadership are eroding at a time when many other nations are gathering strength. Although many people assume that the United States will always be a world leader in science and technology, this may not continue to be the case inasmuch as great minds and ideas exist throughout the world. We fear the abruptness with which a lead in science and technology can be lost—and the difficulty of recovering the lead once lost, if indeed it can be regained at all.*
> –Committee on Prospering in the Global Economy of the 21st Century, National Academies, 2006

> *The nation depends on college and university faculty to discover new knowledge, apply it to practical problems, and enhance community and cultural life through scholarship and service. The supply of future talent is in question, however, especially in science and technology. Among U.S. degree holders in science and technology, foreign-born individuals account for 17 percent of bachelor's degrees, 29 percent of master's degrees, and 38 percent of doctoral degrees. The migration of students to the United States for training in science and technology has been good for us and for the world, but we can no longer rely on imported brainpower. Other nations are competing*

> *vigorously for scientific talent in an increasingly mobile global economy.*
> –National Commission on Higher Education Accountability, 2005

The growing policy interest in comparative national data is clearly related to increased interdependence of national economies and the demonstrated contributions of postsecondary education to economic development, competitive capacity, and well-being in modern, developed economies. Throughout the world, initiatives to invest in postsecondary education, scientific research, and technology are essential components of national economic policy (NSB, 2006). At the same time, data for international comparisons have become much more accessible than ever before. Anyone with access to the Internet can easily generate literally hundreds of sources of data.

International comparisons provide helpful benchmarks against which to make judgments about the effectiveness of U.S. policy and performance. In this respect, they are a logical extension of the last decade's expanded interest in public accountability measures for higher education, although, at the international level, measures reflect aggregate national performance rather than institution- or state-level performance. This focus causes some difficulties for American higher education leaders, analysts, and other observers who are accustomed to more fine-grained assessments of U.S. data with individual institutions, institutional types, or states as the point of departure for analysis of higher education performance. National data don't say much about individual institutions, sectors of higher education, or states, and cannot be used as diagnostic tools to assess performance at those levels. But they still provide a way to look at broad national patterns, and can help raise questions about the cumulative effect of federal, state, and institutional policies on aggregate performance. National data help focus the accountability conversation on the relation between higher education and the rest of society, without assigning blame (or giving credit) to any particular sector or institution and the role it plays within the larger community.

This paper is designed to be a layperson's primer on sources for and factors to consider in making sense of comparative performance measures of postsecondary education. It begins with a general discussion about international comparisons of national performance, and factors to consider in interpreting the information. It turns next to a summary of the most frequently cited international comparisons, and methodological or definitional issues to be aware of in understanding the comparisons. The appendices include a list of questions to ask when formulating or evaluating international comparisons, and information about some of the best sources for comparative data to help individuals who want to know more about source documents.

This paper is not meant to present a comprehensive discussion about all aspects of international comparisons, nor a diagnosis of the state of U.S. postsecondary performance in the world. Any one of these topics could easily command long treatises, so the material presented here is designed to give a short overview of some major headlines, with information about issues underlying some of the measures. The data are presented without commentary about their causes, or implications for the future. To be sure, many of the comparisons presented in this document show aspects of U.S. postsecondary performance seeming to decline compared with that of other countries—a change that many analysts conclude bodes ill for future technological advances, workforce development, and social mobility (see, for instance, Callan, 2006a; Callan, 2006b; Douglass, 2006; and Tierney, 2006). But as this discussion shows, some of the change in the position of the United States compared with other countries is a relative change rather than an absolute decline: The United States has stayed pretty much where it has been for the last several decades, whereas other countries are improving their relative position by investing in growing postsecondary education as well as research and development (R&D). The growth in educational achievement and technological capacity elsewhere in the world is clearly positive, for the people of those nations and for the world as a whole.

The Context for International Comparisons

Making sense of international comparisons is helped by knowing which data sources are most reliable, and being able to sift through the language of international comparisons. This chapter reviews this important background information.

Consistency and data quality. Many of the international comparisons rely on data collected cooperatively by three major intergovernmental organizations: the United Nations Educational, Scientific and Cultural Organisation (UNESCO), the Organisation for Economic Co-operation and Development (OECD), and the European Union (EU). Among these three entities, OECD is the most active in data analysis and reporting. All EU countries are members of OECD, as are the United States, Canada, Australia, Japan, and several other industrialized countries (see Appendix B for more about OECD and its member countries). OECD members cooperatively undertake data collection, checking, and reporting activities. Through committees of country representatives with both policy and technical competence, definitions are refined or revised to permit the reporting of significant features of the scale, organization and structure, financing, and outputs/outcomes of education systems. Also, individual country data reports are checked and discussed for consistency in the application of the definitions. This cooperative framework is used to develop and refine data collection and comparative reporting and analysis in other policy fields as well, such as economic performance, R&D, technology, trade, health, employment, social services, technology, and agriculture, among others.

The U.S. Department of Education participates in the committees that decide on the information to be collected and compared by OECD, UNESCO, and the EU. The Department of Education's National Center for Education Statistics (NCES) staffs technical committees and working groups that come up with definitions that allow for meaningful comparisons. NCES also undertakes the work necessary to assemble and provide the data, under the agreed definitions, to OECD and UNESCO. The data come from routine surveys of states and education establishments (for example, higher education institutions) as well as from individuals in census and labor force surveys, for data on educational attainment, and in specialized assessments such as PISA (the Programme for International Student Assessment) and IALS (International Adult Literacy Survey), for data on achievement and literacy.

As arrangements for the range of education-related activities differ among countries, definitions (and terminology) used for international comparisons have been developed to provide a common basis for comparison while accommodating country differences. The definitions and terminology are worked out cooperatively, with the aim of allowing meaningful and appropriate comparisons. As patterns of and arrangements for learning activities evolve, the definitions and classifications are re-examined.

OECD procedures provide for careful checks of consistency to ensure that countries are reporting on the same learning stages and program types. They also strive for comparability in coverage or quality, so that reporting is complete and includes the same categories of information. Some non-OECD countries also provide data to OECD for certain measures and indicators, and these data are subjected to much the same scrutiny. For other countries and other data elements, the available data have not been subject to such checks for consistency and quality. In China, for example, data submissions to the national government from the different regions historically have been inconsistent. Information from non-OECD countries is improving all the time, however, because of the efforts of UNESCO, organizations such as the International Association of Universities (IAU), and regional groups such as the Association of African Universities (AAU). IAU, in cooperation UNESCO, maintains the World Higher Education Database, a source for comparative information extending beyond OECD members (see Appendix B for more information).

Structural differences. The biggest source of difficulty in interpreting international comparisons comes from differences in educational structures—in the types of institutions, their governance structures and the degree of central governmental control, the length of degree and certificate programs, and the mechanisms for quality control. Countries vary considerably in their approaches to higher education—more widely than across U.S. states—and even though OECD definitions and reporting conventions are designed to minimize the impact of these differences, it is still difficult to make sense of some of the statistics. The U.S. system is less centralized than that of any other major country, with a highly developed group of private not-for-profit institutions and a growing for-profit sector. The United States historically has had a much more open higher education system than was the case elsewhere, with greater mobility of students across multiple institutions and study programs, and opportunities for students to enroll part time. In the United States, a majority of students now accumulate credits from two or more institutions before obtaining their degrees, and 40 percent of students are part time (Adelman, 2006). This has not been the case elsewhere in the world, although that is changing. Mechanisms for the recognition of cross-institution credits exist in Europe, and use of such mechanisms is likely to increase as a result of the Bologna process—one goal of which is to facilitate student mobility within the EU. The U.S. system is in general more privatized than the systems in many other countries—both in terms of funding and governance. And whereas the central national government is the primary source of funding and regulatory control over institutions in most other countries, state government is much more important in the United States.

To address some of these differences, international comparisons employ the International Standard Classification of Education (ISCED) scheme rather than the Carnegie system used in the United States. The ISCED-1997 system was developed cooperatively and adopted in 1997 at the UNESCO General Conference. Compared with earlier international classification schemes, ISCED-1997 provides for more detail in the reporting of a range of degree programs in higher education and introduced a new level—"postsecondary, non-tertiary"—to collect information on programs that previously had not been separately identified. ISCED-1997 categorizes K–12 and postsecondary education based on the level or stage of learning and the orientation of the program, and whether the program is primarily academic or vocational. The majority of what America calls "postsecondary education" is called "tertiary education," and is split into three basic groupings: tertiary 5A (academic programs at least three years in length other than the doctoral degree), tertiary 5B (vocationally and professionally oriented programs of at least two years duration, but typically shorter than tertiary 5A), and tertiary 6 (academic doctoral programs culminating in a dissertation). The classification scheme refers to programs, not institutions. Most international comparisons do not distinguish between the relative contributions from different types of institutions (that is, community colleges, liberal arts colleges, research universities, and so forth).

The ISCED Classification System

Level 0: Preprimary education. Includes the initial stages of organized instruction, and can be either school based or non–school based. Preschool and kindergarten programs in the United States are level 0.

Level 1: Primary education. Typically begins between ages 5 and 8, and lasts on average four to six years. Level 1–stage students begin to study basic subjects such as reading, mathematics, and writing. U.S. elementary school is level 1.

Level 2: Lower secondary school. A continuation of basic studies, and more subject-focused. Usually lasts between two and six years, and begins around age 11. Middle and junior high school in the U.S. context are level 2.

Level 3: Upper-secondary school. More specialized, and typically begins around age 15 or 16 and lasts from two to five years. ISCED level 3 courses can be primarily academic (preparation for university), vocational (preparing for jobs), or further schooling (adult or developmental education). U.S. high school is level 3.

Level 4: Postsecondary non-tertiary education. Primarily vocational and taken after the completion of secondary. Included as part of secondary education in many countries, but not in the United States, where it is included in postsecondary education. ISCED level 4 programs in the United States are typically certificate programs in community colleges, or one-year vocational/technical programs in non–degree-granting schools.

Tertiary education is the highest level of education, and is divided into three categories:

Level 5A: First stage of academic higher education. U.S. bachelor's and master's programs are level 5A, as are most professional programs (teacher education, law, engineering, medicine) (Yonezawa & Kaiser, 2003).

Level 5B: Technical and vocational higher education. U.S. associate degree programs, whether vocational or academic, are counted as level 5B because they are two years or less in length.

Level 6: Doctoral education.

Because of the separation of undergraduate education into tertiary 5A and 5B, and graduate and professional education into tertiary 5A and 6, comparisons of U.S. performance with that of other countries using the ISCED structure are still not straightforward. Some measures—such as aggregate measures of educational attainment—can get around some of the structural differences, and comparisons over time can show trends in performance. These types of aggregate measures have the greatest reliability in the international arena, and are discussed in more detail in the next chapter.

Degree content and structures. International comparisons are often made about degree production, and the rate at which different countries are producing graduates in high priority fields such as science and engineering.[1] Differences in national norms for degree attainment make these comparisons somewhat difficult, particularly if one is interested in getting some sense of the quality and not just the volume of degree output. As just one example, expectations vary about study length—and whether the "norm" for the "first" degree is three, four, or five years. Similar differences occur at the graduate level between master's and professional programs, which can be one to four years. A good source of information about degree nomenclature, including years to degree, can be found in the IAU World Higher Education Database country directories, which provide information about terminology and years of study associated with different degree levels.[2] Variations in degree nomenclature and content for institutions within the EU should be diminishing because of the Bologna process currently underway, which has the goal to standardize degree length and nomenclature across the EU. The comparative data on degree production do not attempt to account for differences among countries in the definitions of degrees or in the quality or content of degrees. However, aggregate comparisons of trends over time can still be helpful in showing broad patterns and identifying gainers and losers.

The Bologna Process

Countries within the EU are currently undergoing what is potentially the most radical and comprehensive international curriculum and degree redesign ever attempted. The Bologna agreement stems from a goal set by EU education ministers to grow educational degree production as part of a common effort to increase economic growth by investing in educational growth. One facet of this policy became a commitment to increase international enrollments within EU countries by removing barriers to degree and credit transfer through greater harmonization of degree types to a two-cycle structure (undergraduate or first degrees of three years in length, and second or master's degrees of two years). A primary mechanism for achieving harmonization is the "diploma supplement," a standardized description of the degree a student has earned that is appended to a student's diploma so that anyone evaluating that credential can understand the nature and structure of the degree awarded. Implementation of the Bologna process is underway throughout the EU; it is not yet complete and observers think that some aspects of it may never be fully implemented. Nonetheless, the goal is to move toward a system of more readily comparable degrees, to promote student mobility through credit transfer systems, and to encourage European cooperation in quality assurance (see, for instance, Witte, 2006).

[1] See the next chapter for more discussion about those comparisons.

[2] The database can be access at www.unesco.org/iau/onlinedatabases/index.html. A description of the database appears in Appendix B.

Age brackets. OECD reports participation and attainment data in several age brackets: 25 to 34, 35 to 44, 45 to 54, and 55 to 64. Much of the traditional focus for U.S. postsecondary measures is on "traditional" college-age students in the 18- to 24-year-old bracket. The U.S. position within the international rankings varies depending on the age cohort examined—which is the main reason why some reports will show the United States in first place in postsecondary attainment, while others show it dropping to fifth or seventh place. As discussed in more detail in the next chapter, all of these figures are correct—they just are measured against different age cohorts.

Making Sense of Commonly Reported Statistics

This chapter provides snapshots of some of the more prominently reported comparative statistics—along with a discussion of the data sources, and issues to take into account in interpreting the data. The sections include comparisons in the areas of:

1. Educational performance (including measures of attainment, participation, graduation, and student learning).
2. Production of scientists and engineers.
3. Finances.
4. Spending on science and technology.
5. Student mobility and international student enrollments.
6. International rankings of institutions.

Educational Performance

While U.S. higher education has long been admired internationally, our continued preeminence is no longer something we can take for granted. The rest of the world is catching up, and by some measures has already overtaken us. We have slipped to 9th in higher education attainment and 16th in high school graduation rates.

–National Commission on the Future of Higher Education, 2006

Glossary of Important Terms

Attainment Rate. An attainment rate is an indicator of the "educational capital" in a country, and is computed by dividing all individuals in an age range who have attained a given level of education at any time in the past by the total number of individuals in that age range. The calculation is the same regardless of the level of education examined. Following is an example of the upper-secondary attainment rate for 25- to 34-year-olds, as it would be computed for the United States:

$$\text{Attainment rate} = \frac{\text{Persons aged 25 to 34 with a high school diploma or equivalent}}{\text{All persons aged 25 to 34}}$$

Graduation/Completion Rate. In comparative usage, the graduation or completion rate is a broad measure of the performance of an entire educational system in producing graduates. It is computed by dividing the total number of graduates in a given year by the number of individuals at the typical age of program completion (for example, 18 for high school graduates in the United States). Following is an example of the upper-secondary graduation rate as it would be computed for the United States:

$$\text{Upper-Secondary Graduation rate} = \frac{\text{Persons who completed high school in a given year}}{\text{All persons aged 18 in that year}}$$

Change in Tertiary Participation. This measure is the percentage change in enrollment during a given period, adjusted to account for the percentage change in population growth during the same period. It attempts to measure real change in participation, above and beyond any change due to population growth.

Educational attainment. Measures of educational attainment are some of the most commonly reported international comparisons. Two measures cited often are the upper-secondary educational attainment rate, or the proportion of the population in a given age range that has completed upper-secondary

Table 1:	Population that has attained at least upper-secondary education	United States (%)	OECD Average (%)	U.S. Rank (%)
Upper-Secondary Attainment: United States Compared with OECD Average, by Age Group: 2004	Age 25–34	87	77	10
	Age 35–44	88	71	6
	Age 45–54	90	64	1
	Age 55–64	86	53	1
	All adults age 25–64	88	67	2

Source: Organisation for Economic Co-operation and Development (OCED). (2006). *Education at a glance: OECD indicators 2006*, Table A1.2a. Paris: Author.

education (high school) and tertiary (higher) educational attainment rate, or the proportion that has completed some level of tertiary education. The former measures broadly a country's success in providing its youth with a basic high school education (see **Table 1**), while the tertiary attainment measure gives some indication of the level of success in providing the population with higher education (see **Table 2**). The source data for measures of educational attainment are population surveys or census data (in the United States, the Current Population Survey produced by the U.S. Census Bureau).

Table 2:		Age 25–34 (%)	Age 35–44 (%)	Age 45–54 (%)	Age 55–64 (%)	All Adults Age 25–64 (%)
Proportion of the Population That Has Attained Some Level of Tertiary Education, by Age Group: 2004	United States					
	Tertiary 5B	9	10	10	8	9
	Tertiary 5A or 6	30	30	31	28	30
	All Tertiary	39	39	41	36	39
	OECD average					
	Tertiary 5B	11	10	8	6	9
	Tertiary 5A or 6	24	20	17	13	19
	All Tertiary	31	27	23	18	25
	U.S. rank compared with top OECD performers					
	Tertiary 5B	18	15	14	14	16
	Tertiary 5A or 6	4	2	1	1	1
	All Tertiary	7	4	1	1	2

Note: *Tertiary 5A or 6* includes all tertiary level 5A plus all of tertiary level 6—essentially academic undergraduate, master's, professional, and doctoral programs.

Source: OECD. (2006). *Education at a glance: OECD indicators 2006*, Table A1.3a. Paris: Author.

As the statistics in Table 2 show, the rank of the United States among OECD countries changes quite a bit depending on the age group examined and the level of tertiary education that is measured. The United States is first in educational attainment among those aged 45 to 54 and aged 55 to 64, both with respect to all tertiary levels (5A, 5B, and 6) and levels 5A and 6 (a bachelor's degree or more in U.S. parlance), but has slipped in educational attainment by younger groups. It is important to note, however, that for the attainment of tertiary 5A and 6 among 25- to 34-year-olds, the United States has fallen behind only three countries: Norway, the Netherlands, and South Korea.

At the 5B level, the United States ranks 18th for 25- to 34-year-olds and 16th for all age groups. However, considerable variation exists among countries in what is counted as attainment. For example, Canada ranks first in 5B attainment for 25- to 34-year-olds, with 26 percent of that population having attained at the 5B level. In contrast, only 9 percent of U.S. 25- to 34-year-olds have attained at this level. Statistics Canada, the Canadian federal government statistical agency, includes in this category those who have earned any type of certificate, whereas the U.S. data source (the Current Population Survey of the U.S. Census Bureau) includes only those who have earned an associate degree. According to OECD, Germany, with its well-developed system of vocational education, reports that only 8 percent of its young adults have earned a 5B credential. This appears to be because most of these credentials are counted in the non-postsecondary level 4 category. Since these data are so variable, the most reliable indicator of postsecondary educational attainment is the percentage who have attained a bachelor's degree or higher (tertiary 5A and 6).

Change in participation rates. Another commonly used measure is the rate of change in tertiary participation, which is enrollment growth adjusted to account for change that is due to population growth. This measure indicates whether a country is growing its educational capital, falling behind in enrollment relative to population growth, or more or less holding steady. This statistic is often cited as evidence that the United States is losing ground in educational capital relative to international performers (see, for instance, Tierney, 2006). This comparison shows OECD countries growing postsecondary participation by an average of 36 percent since 1995—achieved by growing enrollments despite declining populations. In the United States, enrollments also increased—by 12 percent—but much of this increase was attributable to growth in the population, so that the net participation rate for the United States grew by just 5 percent. Participation is still growing, but not as rapidly as elsewhere among OECD countries (see **Table 3** on page 14).

In this case, the low figure for the United States should be read as a relative comparison—a decline in the rate of growth on an already high base of achievement. Most of the countries showing the greatest growth in rates of participation are starting from a low base. For instance, Hungary has more than doubled its rate of postsecondary participation, but only 17 percent of its adult population aged 25 to 64 has achieved some postsecondary attainment, compared with the United States, at 39 percent (OECD, 2006). As these

Table 3: Changes in Tertiary Education Participation: 1995 to 2003

	Percentage Change in Enrollment (%)	Percentage Change in Population (%)	Percentage Change in Participation Rates (%)
Hungary	129	-11	132
Greece	89	5	80
South Korea	59	-16	75
Czech Republic	70	-7	74
Iceland	83	6	74
Sweden	46	-5	55
Portugal	33	-5	40
Denmark	22	-10	37
Mexico	46	9	34
United Kingdom	26	-3	31
Ireland	42	10	28
Spain	21	-7	27
Australia	29	3	26
Finland	25	0	26
Norway	17	-8	26
Belgium	16	-3	22
Germany	4	-15	19
France	3	-6	10
United States	12	7	5
Austria (2002)	7	-22	1
Average	33	-4	36

Note: Countries are ranked by change in participation rate. U.S. indicators are based on the October Current Population Surveys, as reported by the U.S. Census Bureau.
Source: OECD. (2005a). *Education at a Glance: OECD indicators 2005.* Table C23. Paris: Author. See www.oecd.org/document/11/0,2340,en_2649_34515_35321099_1_1_1_1,00.html.

countries get their participation rates closer to those achieved by the top-performing nations, the rates of growth in participation will inevitably slow.

High school (upper-secondary) graduation rates. High school (upper-secondary) graduation rates are calculated as the ratio of upper-secondary graduates to the total population at the typical age of graduation—a number that allows each country's volume of graduates to be gauged in a similar way, while taking into account the differences in streams and timing (see **Table 4**). The United States has one of the highest high school graduation rates for students completing general programs. But when the graduation rate measure is broadened to include graduates of prevocational/vocational programs—programs that figure more prominently in a number of other countries—the United States falls to close to the bottom among OECD countries.

College graduation rates. College graduation rates present some of the greatest methodological challenges for international comparisons because of differences in degree structures, the proportion of students who attend full and part time, degree of variation in student age at entry, and mobility of students among institutions. OECD calculates "gross graduation rates" by dividing the number of graduates per year by the total population in a country at the typical age of graduation. Tertiary graduation rates are reported separately for different levels of enrollment (tertiary 5A, 5B, and 6) separated by length of the degree program (three years, five years, or six years for bachelor's degrees, for instance). In the United States, graduation rates typically are calculated using a cohort method, defined as the ratio of graduates to initial entrants. The OECD calculation produces a lower rate than the U.S. method, because the denominator is larger. Recognizing these disparities, the OECD comparison of graduation rates for tertiary 5A shows the United States well below most other countries—ranking 14th in the latest OECD report (see **Figure 1** on page 16).

Assessments of student learning. Another critical area in which a good deal of work has been done is in comparative assessments of student learning. Several assessments compare student learning internationally for students in primary and secondary schools. The most commonly reported assessments are PISA (Programme for International Student Assessments), TIMSS (Trends in International Math and Science Study), PIRLS (Program in International Reading Literacy Study), and ALL (the Adult Literacy and Lifeskills Survey). PISA is handled as a separate activity through OECD auspices. OECD exercises broad oversight, a prime contractor conducts most of the work, and steering the projects is the responsibility of a large group of more than 60 participating countries. A review of the content and results of these examinations goes well beyond the scope of this short paper. Detailed information about the examinations and the results can be found on the NCES web site (http://nces.ed.gov/surveys/international/), and in a summary report of international comparisons on education in the G-8 countries[3] produced every other year by NCES (Sen, Partelow, & Miller, 2005). No comparable international studies attempt to measure student learning in tertiary education.

Table 4: Upper-Secondary Graduation Rates: 2004

	General Programs (%)	Pre-vocational or Vocational (%)	Total Unduplicated (%)
Norway	66	45	100
Germany	36	62	99
Korea	66	30	96
Ireland	66	34	92
Japan	68	24	91
Denmark[1]	58	56	90
Finland[1]	52	75	90
Switzerland	29	70	89
Czech Republic	18	69	87
Hungary	71	21	86
Iceland	61	52	84
Slovak Republic	22	68	83
Italy	29	67	81
France[1]	33	70	81
Poland	43	45	79
Sweden	37	41	78
United States	75	–	75
Luxembourg	28	42	69
Spain	45	25	66
Turkey	34	19	53
Mexico	34	4	38

[1] Year of reference: 2003.

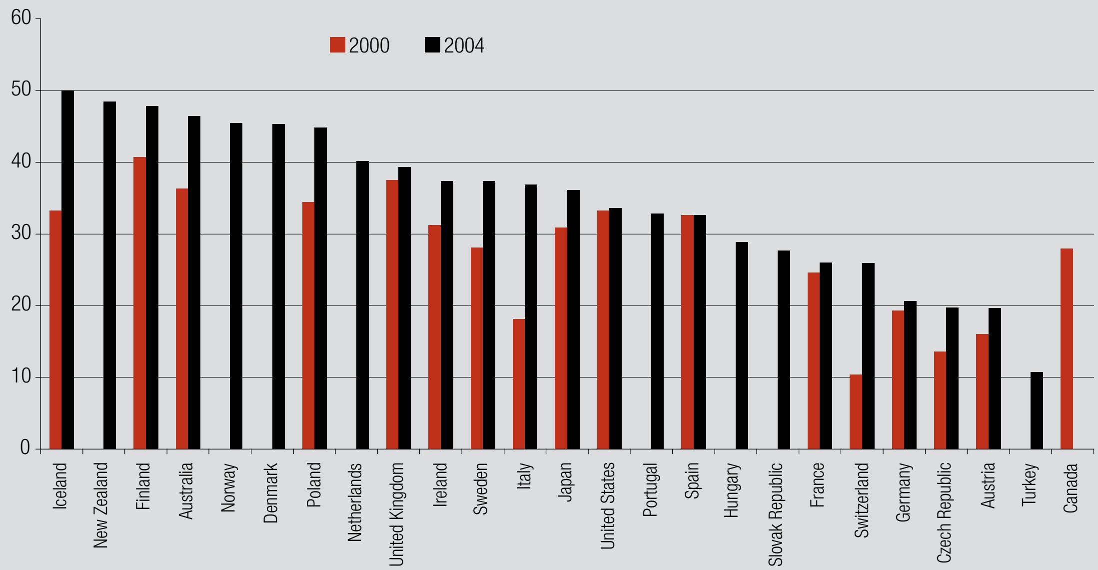
Notes: Mismatches between the coverage of the population data and the student/graduate data mean that the participation/graduation rates for those countries that are net exporters of students may be underestimated and those that are net importers may be overestimated. Countries are ranked by total graduation rates. Not all countries reported a total rate in that year (Australia, Austria, Belgium, Canada, Greece, Netherlands, Portugal, and United Kingdom did not report).

Source: OECD. (2006). *Education at a glance: OECD indicators 2006*, Table A1.2a. Paris: Author.

[3] The Group of Eight (G-8) is an international forum for the governments of Canada, France, Germany, Italy, Japan, Russia, the United Kingdom, and the United States. Together, the eight countries represent about 65 percent of the world economy.

Figure 1

Tertiary 5A Graduation Rates: 2000 and 2004



Note: Some data not available. Countries are ranked in descending order of the graduation rates for tertiary 5A education in 2004. See Annex 3 of the source publication for notes on individual country statistics (www.oecd.org/edu/eag2006).
Source: OECD. (2006). *Education at a glance: OECD indicators 2006.* Paris: Author.

Production of Scientists and Engineers

Worry about declining U.S. production of scientists and engineers is another frequent focus in international comparisons (see, for instance, Committee on Prospering in the Global Economy of the 21st Century, National Academies, 2006; National Association of Manufacturers, the Manufacturing Institute, and Deloitte & Touche, 2003; and Research and Policy Committee of the Committee for Economic Development, 2003). Briefly put, the concern is that the U.S. production of scientists and engineers is well behind what it needs to be either to keep pace with growing capacity elsewhere in the world, or to meet the need for replacement workers because of the impending loss of the baby-boom scientists who are now entering retirement. This section discusses some of the most widely cited statistics comparing preparation of scientists and engineers.

Baccalaureate production in science and engineering. International comparisons of baccalaureate production (or the number of degrees earned) in scientific and technological fields are reported by both OECD and UNESCO, and by the U.S. National Science Foundation (NSF). Information for U.S. submissions comes from NCES (degree production) and NSF (labor-force participation and economic returns to education). Information from other countries comes from data submitted by ministries of education, using the discipline and degree nomenclature of the reporting country. And the differences in degree structure and curriculum content among countries means that the degree quality and content may be quite different.

Table 5: Number of Science and Engineering Bachelor's Degrees, by Field: 1983, 1993, and 2002

Number of Degrees (in thousands)

	Social and Behavioral Sciences	Biological and Agricultural Sciences	Engineering	Computer Sciences	Physical Sciences	Mathematics	Total
1983	128.65	55.41	72.67	24.68	16.20	12.66	310.27
1993	186.59	59.62	62.71	24.58	14.19	14.85	362.54
2002	196.44	79.13	60.64	49.14	14.02	12.27	411.64

Source: National Science Board. (2006). *Science and engineering indicators 2006.* Arlington, VA: National Science Foundation (volume 1, NSB 06-01; volume 2, NSB 06-01A). See www.nsf.gov/statistics/seind06/.

The international comparisons produced by NSF and OECD show similar patterns to the attainment data described earlier; U.S. degree production in science and technology fields is increasing but not keeping pace with gains in other countries. U.S. baccalaureate degree production in scientific and technological areas has increased steadily over the last 20 years, and reached all-time highs with more than 400,000 degrees awarded in 2002. However, growth has been greatest in the social and behavioral sciences, rather than in the disciplines most correlated with R&D in science and technology (see **Table 5**). Low production of engineers in the United States is a particular source of concern, as the number of degrees awarded in this field has declined.

International comparisons are commonly found in reports about U.S. production of degree holders in scientific and engineering disciplines, as these individuals are particularly important to technological advancements, economic growth, and labor-force productivity. Slightly less than one-third of all U.S. bachelor's degrees are awarded to students in science and engineering disciplines—a proportion that has remained quite stable for the last three decades. The corresponding figures for many other countries are considerably higher, led by Japan (65 percent), China (59 percent), and South Korea (47 percent) (NSB, 2006). The United States remains first in the world in the number of bachelor's (or first) degrees awarded in the natural sciences at more than 158,000 degrees in 2002, compared with China in the number two position with 95,000 degrees (see **Table 6**). But here again the rate of increase is less in the United States than in most competitor countries. Growth has been particularly steep in China (doubling degree production since 1993), and the United Kingdom (up close to 62 percent over the same interval).

Table 6: Number of First University Degrees Awarded in Natural Sciences, by Selected Countries: 1983, 1993, and 2002

Number of Degrees (in thousands)

	China	Japan	South Korea	United States	United Kingdom	Germany
1983	NA	22.38	11.39	116.25	18.95	16.20
1993	40.60	28.00	27.98	116.75	33.30	21.15
2002	94.99[1]	35.76[1]	32.37	158.54	53.96	17.00

NA: Not available.

[1] Figure does not include data for mathematics and computer sciences.

Notes: Natural sciences include physical, biological, earth, atmospheric, ocean, agricultural, and computer sciences and mathematics. Data for Germany are for long degree programs (six to seven years). Data for first university degrees use International Standard Classification of Education (ISCED 97), level 5A.

Source: National Science Board. (2006). *Science and engineering indicators 2006.* Two volumes. Arlington, VA: National Science Foundation (volume 1, NSB 06-01; volume 2, NSB 06-01A). See www.nsf.gov/statistics/seind06/.

A greater concern is the declining U.S. production of degrees in engineering. The number of U.S. bachelor's degrees awarded in engineering has shown real declines since the 1980s, a time when China, Japan, South Korea, the United Kingdom, and Germany all increased production (see **Table 7**). One of the problems with international comparisons of engineers is that the different definitions of what constitutes an "engineer" aren't taken into account, nor are qualitative differences in the rigor of the different degree programs. For instance, in 2005 *Fortune* magazine published a statistic showing that the United States was producing only 70,000 engineers per year in comparison to as many as 600,000 in China and 350,000 in India (Colvin, 2005). Yet, researchers at Duke University (2005) who looked into the details of these metrics found that when adjustments were made to account for differences in types of degrees and certificates, and for differences in population size, the United States compares quite favorably to China and India. The *Fortune* figures—taken from official country sources—turned out to include both certificate and three-year degree program graduates, in addition to graduates of baccalaureate programs. The U.S. figures also did not include many graduates in computer sciences, electrical engineering, and information technology—graduates who were typically counted in the figures for the other countries. After scrubbing these data, the Duke team found that U.S. production of engineers is well ahead of either India or China: **Figure 2** shows the differences when the data distinguish between individuals who obtained degrees and individuals who obtained certificates, and **Figure 3** shows these same figures adjusted to account for the differences in population.

Doctorate production in science and engineering. The United States continues to award a significant share of the world's doctorates in science and engineering (see **Figure 4** on page 20), and doctoral-degree production in scientific and technological fields has grown modestly in the United States since 1980. However, most of the real growth has come from holders of temporary visas (see **Table 8** on page 20). The international student pipeline is particularly vulnerable because of growing competition for international graduate students, coupled with post–September 11 difficulties with international student enrollments in the United States (Bain, Luu, & Green, 2006).

Table 7: Number of First University Degrees Awarded in Engineering, by Selected Countries: 1983, 1993, and 2002

	China	Japan	South Korea	United States	United Kingdom	Germany
	Number of Degrees (in thousands)					
1983	NA	70.82	20.64	72.67	10.59	7.4
1993	120.83	88.41	33.04	62.71	19.84	11.57
2002	252.02	103.68	64.94	60.64	20.28	11.47

NA: Not available

Note: Data for Germany are for long degree programs (six to seven years). Data for first university degrees use International Standard Classification of Education (ISCED 97), level 5A.

Source: National Science Board. (2006). *Science and engineering indicators 2006.* Two volumes. Arlington, VA: National Science Foundation (volume 1, NSB 06-01; volume 2, NSB 06-01A). See www.nsf.gov/statistics/seind06/.

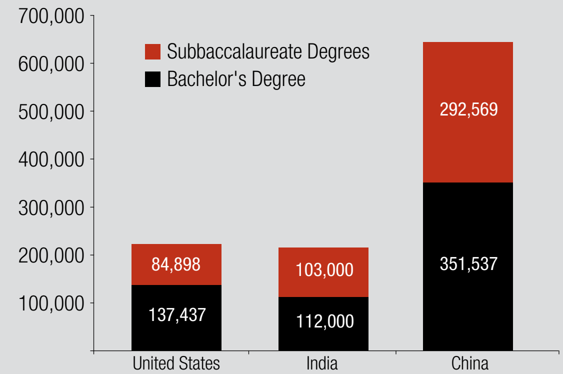
Finances

International comparisons of postsecondary finances are far less standardized than is the case for student participation and degree attainment. OECD and the World Bank both produce reports of postsecondary finance, which include measures of funding by source of funds. One of the more commonly reported figures is the estimate of total educational expenditures per student, and the division of total educational spending between tertiary education and elementary/secondary education. The figures in these comparisons are generally unfamiliar to Americans because they do not conform to the reporting conventions used in the United States, although the source for the U.S. data is the Integrated Postsecondary Education Data System (IPEDS) finance survey administered by NCES.

The following example illustrates the challenge of making meaningful international comparisons of financial information. OECD (2006) reports that total U.S. spending on higher education is $24,074 per full-time equivalent student—more than doubled the OECD average of $11,254. When the proportion of spending going exclusively for R&D is excluded, the U.S. figure drops slightly to around $21,500, whereas the comparable adjustment drops Switzerland (the world leader at $25,900 for total tertiary spending) to $14,335. These figures are averages per student from all revenue sources and for all expenditure categories (including hospitals and other auxiliaries) across all institutions. If median expenditures were used, or if averages were calculated by institution rather than from national aggregates, the U.S. figures would drop considerably, although by how much can't be determined because of the large and growing disparities in wealth among U.S. postsecondary institutions and the variety of missions that U.S. institutions pursue. Likewise, if only instructional expenditures were examined, and if it were possible to

Figure 2

Engineering, Computer Science, and Information Technology Degrees Awarded by Selected Countries: 2004

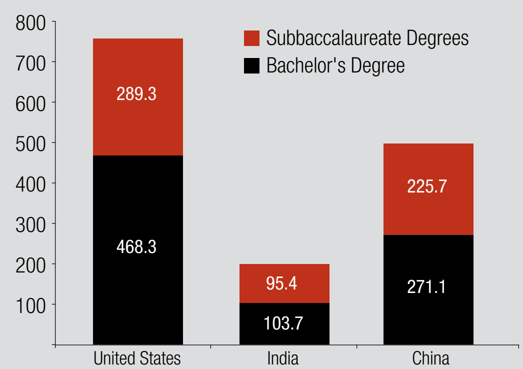


Notes: Data provided by the Chinese Ministry of Education may include engineering and technology degrees outside traditional engineering fields, computer science majors, and IT specializations (for example, auto mechanics). Subbaccalaureate degrees refer to associate degrees in the United States, short-cycle degrees in China, and three-year diplomas in India.

Source: Duke University, Master of Engineering Management Program. (2005, December). *Framing the engineering outsourcing debate: Placing the United States on a level playing field with China and India.* See http://memp.pratt.duke.edu/downloads/duke_outsourcing_2005.pdf.

Figure 3

Engineering, Computer Science, and Information Technology Degrees Awarded per Million Citizens: 2004



Notes: Data provided by the Chinese Ministry of Education may include engineering and technology degrees outside traditional engineering fields, computer science majors, and IT specializations (for example, auto mechanics). Subbaccalaureate degrees refer to associate degrees in the United States, short-cycle degrees in China, and three-year diplomas in India.

Source: Duke University, Master of Engineering Management Program. (2005, December). *Framing the engineering outsourcing debate: Placing the United States on a level playing field with China and India.* See http://memp.pratt.duke.edu/downloads/duke_outsourcing_2005.pdf.

exclude major expenses for pension and health insurance that are included in United States but excluded elsewhere, more reasonable and useful comparisons of relative efficiency and productivity would be possible.

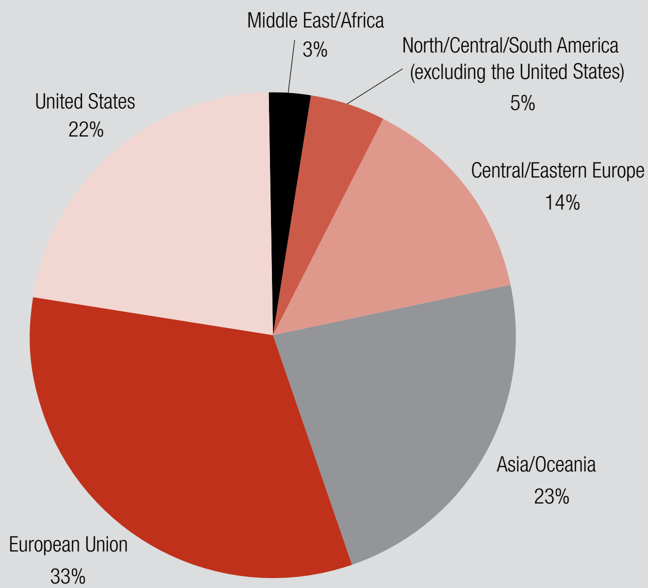
OECD (2006) also reports on the proportion of total spending coming from public, as opposed to private, revenue sources. These figures show that the United States is near the bottom in the proportion of funds coming from public sources at 42.8 percent of total revenue in 2003, second only to Japan at 39.7 percent. The OECD average in that year was 76.4 percent. Tuition payments account for the majority of private revenue recorded and reported by institutions in the United States and in other countries.

Statistics on financing may be helpful for seeing broad patterns, and changes over time in the role of public subsidies for higher education. But the funding statistics are probably the least standardized across the different countries, because of accounting differences in what is reported for expenditures or revenues. Great differences exist among countries in what types of revenues and expenses are counted within postsecondary education—employee benefits are not counted in some countries, but are in others, for example. Capital expenditures are sometimes included, and sometimes (as is typical in the United States) are not. And a portion of higher education funding in the United States is attributable to large expenditures at some institutions for intercollegiate athletics—a major revenue-generator that doesn't exist in other countries.

Comparisons of activities and funding levels in R&D also can be quite murky, because of inconsistencies in reporting from institution to institution, or country to country, in what proportion of activity is conducted within universities as contrasted to affiliated organizations or in business and industry. And national measures of student financial aid and the role of student aid (grants, subsidies for living expenses, and loans) are not readily comparable because of different habits for record-

Figure 4

Distribution of Science and Engineering Doctorates, by Region: 2004



Source: OECD, Education Data Base, Appendix 2-41.

Table 8:		U.S. Citizen		U.S. Permanent Resident	Temporary Visa Holders	TOTAL
		White	Minority			
Number of Science and Engineering Doctorates Earned by U.S. Citizens and Noncitizens: 1983, 1993, and 2003		Number of Degrees				
	1983	12,772	952	934	3,530	19,274
	1993	13,986	1,657	1,701	8,353	26,640
	2003	12,510	2,556	1,157	8,714	26,891

Note: Details do not add to total as figures for other and unknown race/ethnicity and unknown citizenship are not included. Medical/other life sciences reported separately from science and engineering fields in National Science Foundation, Division of Science Resources Statistics (NSF/SRS), higher education publications. For detailed fields, see NSF/SRS, Science and Engineering Doctorate Awards, www.nsf.gov/statistics/nsf05300/htmstart.htm.
Source: National Science Board. (2006). *Science and engineering indicators 2006*. Two volumes. Arlington, VA: National Science Foundation (volume 1, NSB 06-01; volume 2, NSB 06-01A). See www.nsf.gov/statistics/seind06/.

ing revenues. For instance, Canada has a student loan system that is similar to the U.S. program—except, in Canada, institutional revenues from student loans are shown as private revenue, whereas in the United States, they are counted as part of tuition income. In some other countries, but not all, student support from tax credits is reported as tax expenditures.

Researchers or others interested in knowing about comparative international measures of finance and student financial aid can find resources at the International Comparative Higher Education Finance and Accessibility Project at SUNY Buffalo (see www.gse.buffalo.edu/org/IntHigherEdFinance) and the Educational Policy Institute, with offices in Virginia and Toronto, Canada. The SUNY project is directed by Bruce Johnstone, a professor at the institution. The project has developed data sources to measure students' share of costs, and how these compare across countries. The project web site provides links to summaries on higher education finance in many countries around the world (including many countries in Africa, Asia, and Latin America that are excluded from most OECD reporting). The Education Policy Institute (EPI) has also done work in this area, and has produced several reports comparing student aid in an international perspective. Of particular interest is a 2005 report by Alex Usher and Amy Cervenan, which includes international rankings for 15 countries in the areas of affordability and accessibility. According to the EPI researchers, the United States ranks 13th in affordability (ahead of the United Kingdom, New Zealand, and Japan, but behind most of the rest of the EU and Australia), and fourth in accessibility (Usher & Cervenan, 2005).

Spending on Science and Technology

The last 20 years has seen a worldwide explosion of investment in scientific activity unlike anything that has gone before. Between 1990 and 2003, worldwide R&D expenditures are reported to have grown from $377 billion to $810 billion (NSB, 2006). The United States is still the world leader in R&D expenditures, but as in other areas, the relative advantage of the United States is narrowing as other countries are increasing their investments at a more rapid pace.

A number of organizations generate international comparisons on spending for R&D, sometimes reported as "science and technology." The best include OECD, NSF, and the World Bank. By its nature, R&D reporting is heavily financial, which introduces some of the anomalies inherent in all financial comparisons. In the United States, for instance, reporting on academic research is typically confined to extramurally funded contract and grant research, thus excluding most institutionally funded research. This is not the case in many other countries, where institutionally funded academic research is separately reported. The exclusion of institutionally funded (or departmental) research in the United States means that the total volume of university-based research in the United States is understated.

Another problem with international comparisons of scientific activity is that they must assign "credit" to a single country, belying the international nature of scientific collaboration. Science and technology are by their natures not place bound. Scientists collaborate across borders regularly and funding for R&D often comes from a variety of domestic and foreign sources.

Even within a given country, the organization of science and technology, and in particular the fluid relationships among many government research centers, universities, and private organizations (both for-profit and not-for-profit) mean that these categories are somewhat arbitrary.

A few snapshots of recent trends in U.S. R&D performance relative to other countries show analogous patterns to the trends in educational performance: The United States is at or near the top in most measures, but with a declining share of total activity as R&D investment rises in other countries. For instance:

- R&D expenditures and R&D intensity. The United States still leads the world in total spending for R&D at nearly US$285 billion in 2003, well ahead of the entire EU (US$211 billion), Japan (US$114 billion), and China (US$85 billion) (OECD, 2005b). Nonetheless, as in other areas, the United States has slipped relative to other countries in R&D spending as a proportion of gross domestic product (GDP)—a ratio known as a national measure of "research intensity." U.S. research intensity is now at 2.6 percent—still above the OECD average of 2.3 percent, but below R&D intensity in Sweden, Finland, Japan, and Iceland. The decline in the U.S. position is both an absolute decline (from a peak of 2.73 percent in 2001) and a relative decline, because of growing investments in other countries. OECD (2005b) attributes the U.S. drop primarily to a decline in business spending on R&D since 2000. In contrast, government spending for R&D in the United States has risen since the September 11 attacks, particularly in defense-related areas.
- Scientific output. The United States leads the world in scientific output at around 30 percent of the world total, as measured by articles in scientific journals. However, when output is compared with either population or total spending, the United States is closer to the OECD average. And output is growing much more rapidly in Europe and Japan than in the United States At the same time, the level of international collaboration is growing everywhere. The increase in international scientific collaboration, as measured by the volume of coauthored articles (see **Table 9**), seems like a net positive for the world—and calls into question the meaning of nation-specific indicators in what is clearly a fluid situation.

Student Mobility and International Student Enrollments

International student enrollment is increasing worldwide—up by more than 40 percent since 2000, and double just 10 years ago. France, Germany, the United States, and the United Kingdom enroll more than half of all international students worldwide—and the United States leads all other countries in international enrollments, at 22 percent of all international enrollments. However, the U.S. share has declined since 2000, as has Canada's and the United Kingdom's (see **Table 10**). OECD attributes some of the shift to aggressive marketing programs for international students among Pan-Asian countries, but international enrollments also have grown in France, New Zealand, and South Africa.

The discussion of global trends in international student enrollment assumes an agreement on the definition of an international student. However, because countries count international students differently, international comparisons are potentially inconsistent (Bain, Luu, & Green, 2006). Some countries include permanent residents or other long-time residents when reporting international student enrollment, whereas other countries—including the United States—do not. It is estimated that as many as one-third of the international students in some European countries are permanent or long-time residents (Kelo, Teichler, & Wachter, 2006, as cited in Bain, Luu, & Green, 2006). In addition, some countries define international students as students in degree-earning programs only. Other countries use broader parameters: For example, Australia, the United Kingdom, and the United States include students in intensive English-language programs. Definitions not only vary among countries, but also change over time within the same country, making yearly comparisons among countries more difficult. The impact of these discrepancies on data reporting is difficult to estimate (Bain, Luu, & Green, 2006).

A new definition, agreed to in discussions between OECD, Eurostat, and the UNESCO Institute for Statistics, took effect in 2005. The new definition is meant to capture only students who crossed borders expressly for the purpose of study. Under this new framework, *internationally mobile students* are defined as noncitizens of the host country who do not have permanent residency in the host country, and who did not complete their entry qualification to their current level of study in the host country. This change

Table 9:

Country/Region Percentage Share of Scientific and Technical Articles with International Coauthorship: 1988, 1996, and 2003

	1988	1996	2003
United States	10.3	17.6	24.8
EU-15	17.5	27.2	35.6
Japan	8.6	14.6	21.5
China	22.5	28.0	26.8
Asia-8	15.4	21.6	25.8
All others	18.2	34.5	44.5

Notes: EU = European Union. Asia-8 includes South Korea, India, Indonesia, Malaysia, Philippines, Singapore, Taiwan, Thailand, and China. Data for China include Hong Kong. Percentages represent the region/country/economy's share of all internationally coauthored articles. International articles are those with at least one author at an institutional address in a given country/economy and one author at a foreign address. Each collaborating institution is credited with one count so, for example, a U.S./Japanese collaboration would count toward the percentage share for both countries.

Source: National Science Board. (2006). *Science and engineering indicators 2006*. Two volumes. Arlington, VA: National Science Foundation (volume 1, NSB 06-01; volume 2, NSB 06-01A). See www.nsf.gov/statistics/seind06/.

Table 10:

Percentage Distribution of International Students, by Country of Destination: 2000 and 2004

	2000	2004
United States	25	22
United Kingdom	12	11
Germany	10	10
France	7	9
Australia	6	6
Canada	6	5
Japan	4	4
Russian Federation	3	3
New Zealand	0	3
South Africa	1	2
Other OECD	14	15
Other Non-OECD	12	12

Source: OECD. (2006). *Education at a glance: OECD indicators 2006*. Paris: Author.

is unlikely to affect the total number of international students in the United States, because permanent residents are already excluded from the international student category. However, U.S. market share in international students may rise because of this change, as other nations adjust their data to exclude permanent residents.

International Rankings of Institutions

Institutional rankings—or "league tables" in the parlance of the United Kingdom (from soccer leagues)—are comparisons of institutional rather than national-level performance. The *U.S. News & World Report* ranking system is the most recognized within the United States, but there are many others (such as the *Princeton Review* or *Money Magazine*), each with its own set of criteria and ranking methodology. A web site maintained by the University of Illinois (www.library.uiuc.edu/edx/rankint.htm) contains a fairly complete inventory of rankings, both within the United States and worldwide, with commentary on their methodology as well as access to the sites.

Most of the rankings of higher education institutions compare institutional performance within a single country. Some exceptions exist, particularly within disciplines (there are international rankings of business schools and medical schools, for instance). There are also several international rankings of institutions. The most recognizable are Academic Ranking of World Universities produced at Shanghai Jiao Tong University, and the Times Higher Education Supplement-World University Rankings. Both of these are confined to research universities only, and their methodologies are weighted toward measures such as funding, research publications, number of Nobel Prizes, and frequency of citations in published journals. U.S. universities score well in both of these international rankings. Another international ranking, the G-Factor International University Ranking, relies exclusively on a unique measure known as the "G-Factor": the number of links to a university's web site from the web sites of other leading international universities. American universities also do well under the G-Factor rating.

A group of international researchers has organized itself to improve the quality of international rankings. Cosponsored by the UNESCO-European Center for Higher Education in Bucharest, Romania (UNESCO-CEPES), and the Institute for Higher Education Policy (2006), this group has proposed a set of principles of good practice for evaluating ranking systems. The principles include:

- The rankings recognize institutional diversity and take account of differences in institutional mission.
- The rankings are transparent about their methodology.
- Outcomes are measured in preference to inputs whenever possible.
- The data should be audited and verifiable.
- Consumers should be given information with a clear understanding of the factors that are used in rankings, and also be given the opportunity to choose how rankings are displayed.

The full set of recommendations is available at www.ihep.org/Organization/Press/Berlin_Principles_Release.pdf.

Conclusion

International comparisons provide a powerful lens for viewing postsecondary policy and performance—and a new way to think about accountability metrics. However, comparative data and their sources may not be familiar to many in the United States, and officials wanting to use the comparisons can find themselves faced with a bewildering array of data that appear to be in conflict. None of this means that comparative analyses of performance are to be avoided, or must be left to researchers with the time and expertise to comb through all the data. International comparisons of postsecondary performance can be quite revealing of aggregate system-level trends in performance, and broad changes over time. These broad comparisons provide a powerful context for all kinds of policy work. It is not necessary to have absolute precision in the data to be able to look at broad trends, and to make judgments about patterns of performance. It is important to know where to go for the best information, and what kinds of caveats to use in interpreting the data.

This document has presented just a few of the many international comparisons of postsecondary educational performance that can be generated. Appendix B provides an overview of the major sources for additional data and analyses. The growing interest in this topic means that international comparisons are likely to become more commonplace in the future. And, since data on which to base these comparisons are so accessible, college presidents and other officials may want to generate their own comparisons. Accordingly, this paper includes some suggestions about questions to ask in developing or interpreting comparative international statistics (see Appendix A).

Appendix A: Questions to Ask When Formulating or Evaluating International Comparisons

1. For measures of educational participation, attainment, enrollment, or degree completion: What is being measured? These statistics each measure slightly different things. Are the measures the same for all countries? Can you tell what populations are in the numerator and in the denominator, and are these roughly equivalent or comparable for different countries?

2. Are measures restricted to specific age groups, or is performance measured against the whole population? How do performance levels vary by age group?

3. Are part-time enrollments permitted in the countries compared, and are these students counted in measures of attainment or participation?

4. How are educational degrees structured in the different countries, for first, second, and doctoral degrees? Are two-year academic degree programs (associate in arts and associate in sciences) included or not?

5. How do countries being compared differ in terms of important demographic and other population characteristics? For instance, is the population in each country growing or shrinking; aging or getting younger? What are indicators of income equality? Are there ethnic or racial groups that historically have been underrepresented in higher education? What types of progress has the country made in equalizing access and success across racial, ethnic, and gender lines?

6. For comparisons of degree production in specific fields, are only comparable degree types included? How does degree production in a given field relate either to all fields or to the population?

7. In comparing financial statistics, what types of revenues are included? What expenditures are included (pensions, insurance, capital outlay)? Are measures based on aggregate totals for all institutions, or are they an "average of averages" for each institution?

Appendix B: Major Information Resources

Comparative Information on Higher Education

The Organisation for Economic Co-operation and Development (OECD)

The single best source of comparative information on U.S. postsecondary education in an international context is OECD and its annual *Education at a Glance* publication. *Education at a Glance* contains a wealth of statistical information comparing performance in education among OECD member countries. OECD indicators typically included in cross-country comparisons are: (1) outputs (educational attainment of the population, proportion of the population with degrees, quality of learning outcomes from PISA and TIMMS); (2) finances and human resources; (3) access, participation, and progress; (4) factors influencing student success, including time in the classroom, learning time out of school, class size, use of human resources, and comparison of public and private schools.

The Organisation for Economic Co-operation and Development

OECD is an international nongovernmental organization (NGO) comprising countries committed to democratic government and the market economy. Based in Paris, France, OECD began in 1961 as an outgrowth of the post–World War II Marshall Commission. The United States was one of its charter members, and is currently OECD's largest contributor, with a share of nearly 25 percent of the OECD budget and an annual contribution of approximately $50 million.

Membership is by invitation only. Several countries—notably the United States and Japan—have been pressing for a review of ways to expand OECD membership, so it is likely that more countries will join in the next decade. Observers speculate that Russia may be invited to join OECD within the next decade, but that China most likely will not.

The current member countries of OECD are Australia, Austria, Belgium, Canada, Czech-Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Korea, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak-Republic, Spain, Sweden, Switzerland, Turkey, United Kingdom, and United States. OECD also sometimes expands data reporting to the nonmember countries of Chile, Brazil, Israel, and the Russia Federation.

IAU World Higher Education Database (WHED)

The International Association of Universities (IAU), through the IAU/UNESCO Information Center, maintains the World Higher Education Database—a comprehensive compendium of information about higher education in virtually every country of the world. WHED is generated based on annual surveys sent to competent national authorities in each country. The database is available on CD-ROM, with search terms that sort information by country, institutions, or credentials. Within each country, the directory reports on the overall structure of higher education, including degree and credential structures and nomenclature, average length of study, and what the course of study typically qualifies one to do (for example, advance to the next level; transfer credits or not; and whether there are culminating examinations required of all students). Information also can be obtained about individual institutions within a country.

The WHED does not present statistical information or analytical material in the same way as does OECD. Nonetheless, the search tool allows one to get some idea of general comparability across different systems.

Two print directories also are produced based on WHED data. The *International Handbook of Universities* provides detailed data on more than 9,000 universities worldwide, including their structure, courses of study, degrees and diplomas, and so forth. The next edition will be published in late 2007. The *World List of Universities and Other Institutions of Higher Education* provides data on more than 17,500 universities and other institutions specifically offering terminal degrees after three to four years of higher education. The listing of each institution includes the name of the institution in English; the language of the country; the institution's address and general contact information; officers' names with direct contact details; listings of faculties, departments, and major subject areas; and date institution was founded. Details also are provided on all major national academic bodies directly concerned with higher education as well as on agencies dealing with recognition of degrees. The WHED CD-ROM and the two print directories are available in many libraries. Information about ordering them may be obtained through the IAU web site (www.unesco.org/iau/directories/index.html) or through the publisher at whed@palgrave.com or (800) 221-7945. A new publication bringing together these two directories will be released in 2008.

Education Ministries

Individuals may also go directly to Ministries of Education and national statistical agencies in the relevant countries to see what information is publicly available. Many countries maintain web sites, and information is quite accessible. Sources for Ministries' offices may be found in the UNESCO directory, and in the CIA World Factbook (discussed on the next page). Many countries also maintain Census Bureaus, or National Bureaus of Statistics.

U.S. National Center for Education Statistics (NCES)

The NCES annual *Digest of Education Statistics* and *Condition of Education* regularly include a section containing international comparisons of U.S. performance. These reports include data on population, enrollments, achievements, and degrees. The OECD database is generally used as the source for these tables. See http://nces.ed.gov/annuals/.

U.S. National Science Foundation (NSF), Science and Engineering Indicators

Every two years, NSF publishes this compendium of information with supporting analysis about major trends in science and technology. The "indicators" include detailed information about degree production in scientific and technological fields, as well as R&D. Each chapter includes commentary and statistics about U.S. performance in an international context. Many but not all of the international data come from OECD sources; the NSF indicators also provide a good deal of information about scientific and technological performance in non-OECD countries. The

NSF indicators are available online in PDF format, or on CD-ROMs, which are available free of charge. For more information, visit www.nsf.gov/statistics/seind06/toc.htm.

Institute of International Education (IIE), Open Doors

IIE is a nonprofit organization, and its mission is to promote international education by sponsoring study abroad programs and guidelines about information on international study. It administers more than 250 programs, including the Fulbright program. IIE publishes an annual report, *Open Doors*, providing data on U.S. students studying abroad and on international student enrollment within the United States The report contains detailed statistics on enrollment patterns by discipline, country, source of support, and institution of enrollment. See www.iie.org.

National Center for Public Policy and Higher Education, Measuring Up 2006

This "national report card" on U.S. higher education includes a new section on U.S. performance in an international context; The National Center for Public Policy and Higher Education relies heavily on OECD data for this report, but has made a number of adjustments to the statistics to generate more comparable measures in the U.S. context. In addition to aggregate national comparisons, it has generated state-specific comparisons of performance relative to OECD nations. The report is available at http://measuringup.highereducation.org/.

Country-Specific Information

In making comparisons between U.S. performance and that of another country or region, it is helpful to have economic, demographic, cultural, and political information about the countries compared. In addition to knowing about population size, and ethnic and age distribution (Is the population growing or shrinking? How ethnically diverse is it? Is it aging or getting younger? What are the major religions, and are there economic, political, or ethnic divisions among them?), it is important to know something about the relative wealth of the country, and the role that higher education plays as a route to social and economic mobility. There are a number of places where such information is readily available.

CIA World Factbook

One of the most accessible sources of international information is the web-based CIA World Factbook, a comprehensive and up-to-date resource containing detailed information on every country in the world, in standard categories of geography, people, government, economy, communications, transportation, and military (see https://www.cia.gov/cia/publications/factbook/index.html). Using this web site, one can generate world rank-order listings on specific measures within those categories (for instance, the size of the labor force, per capita GDP, or life expectancy). The Factbook site has maps, and uses analogies between other countries and U.S. states to help give the reader a point of reference for geographic comparisons. (For instance, Russia is said to be about 1.8 times the size of the United States; Armenia is "slightly smaller than Texas," and Portugal is said to be about the same size as Indiana.)

The World Bank EdStats Web Site

The World Bank also maintains a web site with a great deal of comparative international data (see http://devdata.worldbank.org/edstats/). The World Bank site has become public in just the last few years, having developed as part of the organization's internal research work for its policy initiatives. As a result, it is more data-rich and less narrative than the CIA World Factbook, and the reports are less standardized. But it also provides much more information about education performance throughout the world, including education related to the economy. For non-OECD countries, it is the best source for statistical information about comparative educational performance. Data for the EdStats are aggregated from OECD in addition to World Bank sources. From the EdStats section, one can generate reports either about a particular country, or about the following educational themes:

- Education expenditure: private education expenditures; rates of return on investments in education.
- Vulnerable populations: children with disabilities and inclusive education; gender disaggregated education profiles.
- Education outcomes: education attainment in the adult population; student learning assessments database.
- School-age population: school-age population estimates.

The Economist, Pocket World in Figures

The Economist magazine publishes a small "pocket" almanac, *The World in Figures*, which is available for purchase from the *Economist* web site (see www.economist.com/theworldin), and is provided to subscribers of the magazine. It contains quick snapshots of data about all of the world's countries, including a small section about education spending and enrollments. It is not web-based, but its small size makes it a convenient and ready resource for travelers (or college presidents giving speeches).

American Association of Collegiate Registrars and Admissions Officers (AACRAO) Electronic Database for Global Education (EDGE)

This is a subscription-based online resource for the evaluation of foreign educational credentials. The database currently includes 48 country profiles, and is being expanded regularly and updated as educational systems change. Each EDGE country profile includes:

- An overview describing the educational history of the country.
- An educational ladder or ladders to reflect changes in the educational structure.
- Grading system(s).
- Sample credentials.
- Placement recommendations.
- List of postsecondary institutions.
- Resources used to develop the profile.
- Author biography and notes.
- Glossary—when applicable.

Visitors to the EDGE web site (aacraoedge.aacrao.org/register/) may preview the country information for Ghana free of charge. Subscription rates range from $250 for AACRAO members to $350 for nonmembers.

Academic Centers

There are many university-affiliated and independent centers studying comparative higher education issues around the world. Below are three of the most active. For a more comprehensive list, visit www.acenet.edu/resources/policy-research/index.cfm.

Boston College Center for International Higher Education

One of the projects of this active organization is the International Higher Education Clearinghouse (www.bc.edu/bc_org/avp/soe/cihe/). The clearinghouse is a relatively new web site that provides researchers and practitioners with a starting point for searching available scholarly and government resources on international higher education. The web site is a source of bibliographies, a venue for links to web sites throughout the world, and a means to identify the location of databases with relevant data. This project is carried out in cooperation with the American Council on Education, the Institute of International Education, and NAFSA: Association of International Educators.

Center for Higher Education Policy Studies (CHEPS), University of Twente (The Netherlands)

CHEPS is an interdisciplinary research institute located at the Faculty of Public Administration and Public Policy of the University of Twente, the Netherlands. Since 1984, CHEPS has undertaken and published a considerable amount of research on higher education, especially at system and institutional levels. CHEPS seeks to increase understanding of institutional, national, and international issues that bear upon higher education. More information is available at www.utwente.nl/cheps/.

The International Comparative Higher Education Finance and Accessibility Project (State University of New York, Buffalo)

This project is a Ford Foundation–financed program of research, information dissemination, and networking now in its second three-year phase. The project is looking at the worldwide shift in the burden of higher education costs from governments and taxpayers to parents and students. This project is operated through SUNY University at Buffalo's Center for Comparative and Global Studies in Education. For more information, visit www.gse.buffalo.edu/org/IntHigherEdFinance/.

References

Adelman, C. (2006). *The toolbox revisited: Paths to degree completion from high school through college*. Washington, DC: U.S. Department of Education.

Bain, O., Luu, D. T., & Green, M. F. (2006, October). *Students on the move: The future of international students in the United States*. Washington, DC: American Council on Education. See www.acenet.edu.

Callan, P. M. (2006a). International comparisons highlight educational gaps between young and older Americans. In the National Center for Public Policy and Higher Education (Ed.), *Measuring up 2006: The national report card on higher education* (pp. 6–10). San Jose, CA: The National Center for Public Policy and Higher Education. See http://measuringup.highereducation.org/_docs/2006/NationalReport_2006.pdf.

———. (2006b, Fall). Our national underperformance: Is American higher education still the best in the world? *National Crosstalk, 14*(4). See www.highereducation.org/crosstalk/ct0406/editorial0406.shtml.

Colvin, G. (2005, July 25). America isn't ready [Here's what to do about it]. *Fortune*. See http://money.cnn.com/magazines/fortune/fortune_archive/2005/07/25/8266603/index.htm.

Committee on Prospering in the Global Economy of the 21st Century: An Agenda for American Science and Technology, National Academy of Sciences, National Academy of Engineering, Institute of Medicine. (2006). *Rising above the gathering storm: Energizing and employing America for a brighter future.* Washington, DC: National Academies.

Douglass, J. A. (2006, June). *The waning of America's higher education advantage: International competitors are no longer number two and have big plans in the global economy*. Berkeley, CA: Center for Studies in Higher Education, University of California, Berkeley. See http://cshe.berkeley.edu/publications/docs/ROP.Douglass.Advantage.9.06.pdf.

Duke University, Master of Engineering Management Program. (2005, December). *Framing the engineering outsourcing debate: Placing the United States on a level playing field with China and India*. Durham, NC: Author. See http://memp.pratt.duke.edu/downloads/duke_outsourcing_2005.pdf.

National Association of Manufacturers, the Manufacturing Institute, and Deloitte & Touche. (2003). *Keeping America competitive: How a talent shortage threatens U.S. manufacturing*. Washington, DC: National Association of Manufacturers. See www.nam.org/s_nam/bin.asp?CID=201721&DID=226411&DOC=FILE.PDF.

National Commission on the Future of Higher Education. (2006, September). *A test of leadership: Charting the future of U.S. higher education.* Washington, DC: U.S. Department of Education. See www.ed.gov/about/bdscomm/list/hiedfuture/reports/pre-pub-report.pdf.

National Commission on Higher Education Accountability. (2005). *Accountability for better results.* Boulder, CO: State Higher Education Executive Officers. See www.sheeo.org.

National Science Board (NSB). (2006). *Science and engineering indicators 2006.* Two volumes. Arlington, VA: National Science Foundation (volume 1, NSB 06-01; volume 2, NSB 06-01A). See www.nsf.gov/statistics/seind06/.

Organisation for Economic Co-operation and Development (OECD). (2005a). *Education at a glance: OECD indicators 2005.* Paris: Author.

———. (2005b). *Science, technology and industry scoreboard.* Paris: Author.

———. (2006). *Education at a glance: OECD indicators 2006.* Paris: Author.

Research and Policy Committee of the Committee for Economic Development. (2003). *Learning for the future: Changing the culture of math & science education to ensure a competitive workforce: A statement on national policy.* Washington, DC: Committee for Economic Development.

Sen, A., Partelow, L., & Miller, D. C. (2005). *Comparative indicators of education in the United States and other G8 countries: 2004.* U.S. Department of Education, National Center for Education Statistics. Washington, DC: U.S. Government Printing Office. See http://nces.ed.gov/pubs2005/2005021.pdf.

Tierney, T. J. (2006). How is American higher education measuring up? An outsider's perspective. In J. B. Hunt & T. J. Tierney, *American higher education: How does it measure up for the 21st century?* (pp. 7–12). San Jose, CA: National Center for Public Policy and Higher Education. See www.highereducation.org/reports/hunt_tierney/Hunt_Tierney.pdf.

UNESCO-European Center for Higher Education in Bucharest, Romania (UNESCO-CEPES), & the Institute for Higher Education Policy. (2006, May 30). *International partnership issues groundbreaking principles on ranking of higher education institutions.* Bucharest, Romania, & Washington, DC: Authors. See www.ihep.org/Organization/Press/Berlin_Principles_Release.pdf.

Usher, A., & Cervenan, A. (2005). *Global higher education rankings 2005.* Toronto, ON: Educational Policy Institute.

Witte, J. K. (2006). *Change of degrees and degrees of change: Comparing adaptations of European higher education systems in the context of the Bologna process.* The Netherlands: Center for Higher Education Policy Studies.

Yonezawa. A, & Kaiser, F. (2003). *System level and strategic indicators for monitoring higher education in the twenty-first century.* Bucharest: UNESCO-CEPES. See www.cepes.ro/publications/pdf/system_level.pdf.

About the Author

Jane Wellman is a consultant and researcher in U.S. higher education and public policy. She currently heads the Washington, DC–based Delta Project on Postsecondary Costs, Productivity and Accountability, where her work focuses on trends in spending within postsecondary education.

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