

The Top American Research Universities

2007 Annual Report

The Center for Measuring University Performance

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Introduction

Rankings, Competition, and the Evolving American University

The apparently permanent, and often desperate, search for the lodestone of academic quality and prestige continues to produce the controversy that fuels the college and university ranking industry. Often inspired by the commercially successful *U.S. News & World Report* publication, newspapers and other publications have entered the competition to produce the most complete, comprehensive, accurate, or popular ranking methodology possible, depending on the publication's chief criticism of *U.S. News* and its own sales strategy. The industry is growing rapidly and has become highly globalized with rankings published for international universities by news organizations such as the [*THES QS World University Rankings*](#), published by *The Times Higher Education Supplement*, or the [*Academic Ranking of World Universities*](#), published by the *Institute of Higher Education at Shanghai Jiao Tong University*.

Much of the international activity, however, focuses on the relative ranking of universities and colleges within regions or countries, given the difficulty of compiling useful comparative information across the widely differentiated contexts of international higher education. For example, the *Maclean's Universities Ranking* focuses on an annual study of Canadian colleges and universities while the *Times of London's Good University Guide* ranks schools in the U.K.

However, recognizing that consumers of university services tend also to be interested in the relative prestige and rankings of the programs they attend, many organizations focus their surveys and rankings on particular programs, especially for business schools. For examples, see *Business Week's Best B-Schools 2006* and its list of the [*Top 10 International MBA Programs*](#); or the *Financial Times Global MBA Rankings 2007*, or the *Guardian's Guide to Universities*, *The Economist Intelligence Unit: Which MBA Online*.

Within the United States, the college and university ranking industry is remarkably robust, with a ranking system to match every preference, style, or institutional context. Some of these rankings speak to specific college-going student groups such as *Black Enterprise's Top Colleges for African Americans*, *Hispanic Magazine.com's Top 25 Colleges for Latinos*, or *New Mobility's Disability-Friendly Colleges*.¹

These examples from among the many surveys and rankings studies listed on the very useful University of Illinois at Urbana-Champaign Education and Social Science Library website on [College and University Rankings](http://www.library.uiuc.edu/edx/rankings.htm) [http://www.library.uiuc.edu/edx/rankings.htm] reflect the growing recognition that quality higher education is not only a major investment in personal opportunity for individual economic success, but a critical component of maintaining national economic competitiveness and the accompanying national prosperity. Whatever the various methodological characteristics of these surveys and rankings (and the quality and reliability vary dramatically), the number and diversity of efforts to identify the best of class among these institutions is remarkable.

The Dynamic Higher Education Marketplace

For those of us who work on measuring university performance, the attention paid to these issues is encouraging, although the confusion of rankings illustrates the difficulty we have in defining what we mean by “quality” or “effectiveness” or “value” when speaking of higher education institutions. Each of the rankings defines these terms in different ways, sometimes with reference to the goals of consumer groups, sometimes with reference to social or economic values believed to be common to the public at large. The review of these rankings demonstrates, among other things, that our terminology for describing the many providers of post-secondary education services and our classification system for describing the services themselves confuses more than it assists the understanding, let alone the ranking, of these providers. None of this should surprise us, as the post-secondary marketplace has experienced significant change over the past generation in the United States, as well as abroad, resulting in wide variation between the thousands of American institutions labeled colleges or universities.

These changes affect the mission, composition, and organization of the American higher education marketplace, and challenge consumers and regulators who attempt to assign common expectations of quality and performance across this large and complex industry. Even though most academics resist the definition of post-secondary education and especially higher education as an “industry,” the forces of commerce and competition have become the primary determinants of institutional success. Although for some this may appear a new development, the competitive context for higher education has been with us for over a century, if not longer.

¹ Other rankings identify institutions by philosophical approach such as the *Mother Jones Top 10 Activist Campuses*, the *John Templeton Foundation: Colleges That Encourage Character Development*, the *Young America's Foundation Top Ten Conservative Colleges*, or *A New Ranking of American Colleges on Laissez-Faire Principles, 1999-2000*. Still others present rankings based on the opinions of student constituencies such as *StudentsReview.com* and *Princeton Review's The Best Colleges Ranked by Students*.

The principal difference today is that the competition is national at least, not just local or regional. Public institutions within a state might previously have competed vigorously for a share of the state appropriation, while today they not only compete within the state, but also in the national marketplace for students, faculty, staff, and funding. Public and private institutions might once have competed primarily within their own sectors, but now public and private universities compete with each other in all markets. Complicating this competition, the traditional funding sources for public higher education have become highly vulnerable to competition from other state services – health care, corrections, K-12 education, retirement programs – as well as threatened by public opposition to revenue increases that reduce the opportunities for tax-based funding – and as such, taxpayer control. Yet even as some states have found it necessary to reduce the money provided to state higher education institutions, driving them towards other revenue sources such as tuition and fees, private and corporate funding, and the like, other states have begun to reinvest in higher education as a mechanism to drive local economic development. This shift to the economic development model tends to focus on research, technology development, occupationally-focused education and training, and participation in state programs to attract industry and business, rather than on the general support of undergraduate and graduate or professional education.

Economic pressure on higher education is significant, although not new by any means. Universities and colleges have always lived in a world of economic challenge; the “good old days” included major financial challenges accompanying the ups and downs of the national or local economies on which the institutions depended. Nonetheless, today’s marketplace for higher education has become both larger and more differentiated. This is a good thing, of course, in that it represents a growing commitment to provide post-secondary higher education opportunities to ever larger proportions of the American population. It also, however, presents a challenge because the needs of this large population of college-bound (or expected to be college-bound) individuals become more and more differentiated as the scale of the higher education industry becomes ever larger.

American colleges and universities in their traditional forms are rather archaic, based on a model of the small residential college with a relatively homogeneous population of students providing a standardized curriculum of study within a fixed time frame. Historically, this population was middle to upper class, studied the liberal arts and sciences, and graduated within four years. Although large universities, public or private, continue to pay homage to this concept, derived from the New England private

colleges and the Jeffersonian commitment to public higher education, their institutions offer a much more complicated and much less standardized set of services.

The highly selective private residential colleges remain viable examples of this model, even though most of them have found it essential to expand beyond the liberal arts core to provide business degrees, engineering programs, and other pre-professional or thinly disguised occupational majors. Outside of these highly selective and usually well endowed private institutions, however, the press for occupationally specific, highly diversified higher education has made most institutions collections of academically distinct programs held together by a loosely defined core curriculum, and in the more selective institutions, a residentially based experiential context for undergraduates. Within the traditional space of the name brand institutions, public and private, and those who imitate them, the key organizing concept is the notion of a college degree, a college experience, that is holistic in some not-too-carefully-defined manner and that carries a brand name that gives to the outside world some impression of consistent quality. The less focused and more differentiated the product of these institutions, the more important the brand name, and the more important the ranking as a marker of brand value.

Content and Context

The most significant challenge in this marketplace is the growing tendency to separate the content of higher education from its context. The content, of course, is the knowledge acquired by students as they pass through a course of study and earn a degree or other certificate of completion. The context includes the delivery mechanisms (teachers, classrooms, libraries, laboratories) and the setting (campuses, residence halls, student unions, sports programs, social organizations, student life, alumni associations). Two different forces are at work here. One push emphasizes the value of the context in preparing individuals for economic and social success. Attend the right college, this frame of reference implies, with the right context, containing the right faculty, and providing access to the right alumni, and the student is presumed to benefit substantially more than if they had attended an institution with a lesser quality context. The other push emphasizes the importance of the skills and knowledge acquired. This frame of reference seeks institutions that provide the student with the most knowledge, the highest possible level of skill in particular useful and occupationally important areas in the shortest amount of time, with the least investment in non-content related activities.

The context-focused institutions and the content-focused institutions coincide on the importance of learning, of knowledge acquisition, and on the preparation of students

for competitive success after graduation. Where they differ is in the approach to providing this result. Although we present these as two distinct models, in fact, most institutions present themselves in the marketplace with programs and options that permit students to construct educational programs that include as much context as they need, want, or can afford. However, the effort to tailor college and university programs to match the needs of many different students, and the competition among providers to capture as much of the marketplace as possible, has led to the increased fragmentation or decomposition of the traditional college and university product.

As the industry finds profit (or in the case of not-for-profit institutions, surplus) in offering highly differentiated programming to the market, many traditional institutions, especially in the public sector, find it more difficult to maintain the coherence and focus of institutional purpose. When institutions profitably sell some of their programs in online formats to constituencies completely external to the campus, the most financially successful online programs tend to be those with very high value to the consumer (business and other professionally oriented programs) or those of more general nature for which a large population (the military, for example) can be identified. Another profitable alternative is for institutions in the public sector to receive subsidies to provide online versions of their programs at low prices to populations geographically distant from any campus. The online education marketplace (both for- and not-for-profit) remains in a state of continuing and rapid evolution, but for this discussion our interest is in the impact on the traditional university.

When an institution sells a portion of its curriculum to off-campus constituencies it must design a different content delivery process from the on-campus process. The experience of online education clearly demonstrates that there is a high cost to the initial redesign of the delivery system to effectively provide online learning even if the content is identical to on-campus content. However, once designed and implemented, successive iterations within the delivery system and the expansion of its scale become much less expensive. This differs from the on-campus content delivery model in which small class size and student-instructor personal interaction are perceived to be significant elements signaling quality. This perception makes it difficult to gain economies of scale in on-campus settings, placing a practical limit on the size of campus-based institutions (and explaining to some extent the proliferation of economically inefficient relatively small institutions).

The online delivery system, in addition to separating the content from the context, also decouples the content delivery from specific and relatively permanent instructional

staff, assigning it instead to a system that can easily use qualified but contingent instructional staff. Moreover, the economic model of online education does not invest in a traditional professional faculty career for its instructional staff; it only invests in the ability of a contingent staff to deliver content within the online program. The online educational model recognizes that the brand name of an institutional sponsor is more important to the consumer than the name of the instructors offering the course. Brand-name faculty might design the content and validate the quality, but the actual instructional effort can be provided by an instructor with specialized skills for online education and in whom the online enterprise would have little permanent investment.

This shift from permanent investment in context to market-based investment in just-in-time educational delivery draws strength from the on-campus shift to greater reliance on contingent faculty. On the campus, one of the critical differentiating elements used to compete in the marketplace is the quality of the context within which education takes place. Student services, recreation facilities, intra-campus sports facilities, competitive intercollegiate sports, health programs, student activities and programs, and the like represent significant competitive features of college life. In addition, absent reliable indicators of quality content, institutions invested heavily in facilities to serve as symbols of the quality instruction that would take place inside. Well-equipped auditoria, elegant laboratories with the latest equipment, learning centers, academic support centers, large electronic databases for teaching and research purposes, and elaborate instructional technology all served to attract sufficient student populations to sustain the institutional programs. Yet, these things proved highly expensive, and ratcheted costs upward often beyond the ability of tuition and fee increases or state and national subsidies to support. Some institutions with strong public support in their legislatures and in states with dynamic economies (often in the Sunbelt) found it possible to invest in all the competitive amenities needed while at the same time maintaining reasonable net prices to students. But, many institutions found the price-cost squeeze too great and sought ways to reduce some of their permanent costs.

Deconstructing Faculty Work – Subsidizing Research

One cost reduction method involved deconstructing faculty work into its various components. Much faculty work is associated with teaching undergraduate students to fulfill the needs of the curriculum. However, the permanent faculty also has many other functions including administrative (recruiting and hiring faculty, reviewing curricula, managing departmental affairs, serving on university committees), student advising (in some institutions the faculty

provide advising support), and research and creative activity. Because the permanent faculty represent a continuing capital-like cost (the investment in a tenured faculty member is a 25-year commitment to a relatively non-liquid asset) that limits the institution's flexibility to reassign people to new programs to meet market demands, many universities began hiring more contingent faculty and reduced the number of permanent faculty. This shift is well along, although it is much more visible in the less selective institutions and less prevalent in the highly selective institutions.

Contingent faculty represent a flexible professional work force. Hired part-time or full-time as needed, on a one-semester, one-year, or five-year basis; hired for one course or a full course load to meet the needs of the institution at any particular time, the contingent faculty can grow, decline, or change specialty as required. For a given unit of instruction, contingent faculty are almost always less expensive as well.

When we decouple the instructional function from the permanent faculty we also highlight the specialization of the research function. If we can buy teaching talent on a piecework, contingent basis, we can also buy research talent separately and on a contingent basis. In many ways, research universities have understood this for years, even when hiring faculty on a full-time tenured basis. For a research university, a faculty member's teaching abilities represent in most cases a stable and reliable resource. Good teachers tend to remain good teachers for their entire careers. However, a faculty member's research abilities reflect a much more fragile and unpredictable resource. Research talent is relatively rare compared to teaching talent, and outstanding researchers may not be able to sustain their early productivity throughout their careers. Large research universities buffer this risk by expecting tenured faculty to teach and perform research and creative activity throughout their careers, recognizing that when a faculty member is highly research productive their teaching contribution will be less but if their research productivity declines, their teaching contribution can increase.

However, the large scale of scientific research and the exceptional cost of facilities have led to the growth of a large number of contingent research faculty (again in response to the institution's concerns about the risk associated with the inflexibility of permanent faculty employees). Contingent faculty in research can be labeled post-docs or research faculty, but what they share is identification with specific research projects and a dependence on the funding associated with those projects. When the funding disappears, the university has no long-term obligation to contingent research faculty.

As is always the case in American higher education, these trends express themselves in remarkably different ways depending on an institution's profile, the market niche it occupies, the character of its financial structure, and its history. Nonetheless, as the higher education marketplace continues its rush into ever more intense competition, we can expect to see continued fragmentation as institutions focus their attention where their comparative advantage is greatest. We will see even more specialized institutions emerge; we will see continued resistance to regulatory efforts that attempt to standardize or homogenize the content or outcomes of the industry (because such regulation limits the ability to specialize). The current attention to branding will increase as a substitute for clearly understood differences among the many products delivered by a single institution or as the result of an effort to spread brand value derived from one institution across the products of all institutions within systems. By having a strong brand, an institution can sell many distinct products (some of lower quality and some of higher quality) all under the same name. All consumer product and service industries use their brands in this fashion – and higher education is not far behind.

Measuring the Results of Investment

In The Center for Measuring University Performance, our focus on the Top American Research Universities shows that the fundamental requirement for research university success is money. University research is a product sold below cost to its primary consumers. Successful research universities find alternative, secondary consumers of research success who will pay the difference between the cost of research and the compensation provided by direct research sponsors in exchange for a wide range of benefits. Some investment comes from public sources, often state and sometimes local governments that pay in hopes of a general return to their economy of greater employment, a larger tax base, and other social benefits. Some funding comes from foundations who seek philanthropic returns on investments through improvements in health care, the environment, or other social, cultural, and economic opportunities. Research funding also comes through private giving to endowment or direct gifts, providing the donor the benefit of philanthropic achievement and often the vicarious or even direct participation in the creation of knowledge. Indirect research support also comes through subsidies from the undergraduate program to graduate and research activities of an institution in return for more complex undergraduate programs and the association of the undergraduate degree with the highly visible prestige of internationally preeminent research or creative faculty. Corporate funding seeks a direct commercial benefit from the research work of the university, often subsidized by

other sources. And finally, the federal government provides large amounts of funding for research products that serve national goals, but almost never pays close to the full cost of the research it sponsors.

As a consequence of this process, American research universities continue to focus tremendous effort on the challenge of finding sufficient funding to subsidize research productivity. The value of university research to the nation is exceptional by every measure or study ever done. But this university research enterprise is extraordinarily competitive because the supply of talent capable of contributing to the research agenda is limited and the funding required to support this limited talent is inadequate. Consequently, universities that can find the money to purchase talent and support will have the best chance in the competition. Money is a fundamental requirement, but it is not sufficient to guarantee high levels of research performance. In addition, research universities have to be focused, efficient and performance based. The better the university manages its research productivity by measuring its competitive success, the more research performance it will get from whatever funds it acquires to invest in research.

Campuses, Systems, and Medical Schools

The Top American Research Universities methodology for categorizing institutions continues the practice of focusing on campus-based research institutions. As the higher education marketplace becomes more and more complex, the value of clearly defined performance criteria will increase. This publication seeks to identify the elements that contribute to and help define exceptional research performance by single institutions. We know that many multiple campus systems seek to collect the performance of their institutions under one brand name to enhance the value of that brand. This may well be an effective positioning strategy within the competitive context. However, the goal of this publication is not to evaluate the aggregate characteristics of brands but to collect reasonably consistent data about the performance of individual research-oriented institutions. Consequently, we report data by institution, which sometimes requires an estimate when the institution's productivity is only reported as part of a system aggregate.

Even with this effort, we recognize some significant issues still remain. The most important of these is the impact of research-oriented medical schools. If a campus-based medical school is highly research intensive, it can represent a substantial portion of a campus' research productivity and contribute significantly to other characteristics we measure (such as post-docs or faculty awards, for example). When we compare the research productivity of a campus with a research intensive medical school to a campus without such a unit, the result is not always as useful as we would like. For that reason, beginning with the 2006 report, we have begun including a table that displays the research productivity of institutions with and without the component represented by the medical school. This does not form a part of our general report and the associated classifications, but it does provide additional information for understanding the differences in research productivity among these campus-based institutions.

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