

The Top American Research Universities

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The Center for Measuring University Performance

*Elizabeth Capaldi Phillips
John V. Lombardi
Craig W. Abbey
Diane D. Craig*

The Best American Research Universities

Rankings: Four Perspectives

by Diane D. Craig and John V. Lombardi

Nothing stirs the public imagination about higher education more than rankings, unless it's football. Rankings are a major national sport themselves, feeding an insatiable market searching for the best universities and colleges in America, and even should they be so interested, abroad.

These league tables, so named to link them with the also ever-popular sports team rankings, purport to identify institutions that students and parents, alumni and donors, governments and foundations should look to for quality, accessibility, economy, and employability. The notion is that a ranking purveyor can find just the right mix of indicators, weight each one in the proper amount, mix them together, and produce an ordered list from one to over 100 that can serve as a guide to institutional merit.

Merit, however, is in the eyes of the beholders who differ significantly in what they see as important about universities. Merit as a calculated quantity suffers from the illusion of mathematical accuracy because the process is numerical. Many people fail to remember that the statistics are only as good as the numbers going in and the appropriateness of the formulas that deliver the output. Because educational data are often difficult to interpret and their meaning varies greatly depending on the context of the institutions involved (large or small, rich or poor, public or private, for examples), the process of amalgamating data from widely differentiated colleges and universities is fraught with ample opportunity for misinterpretation and meaningless statistics. Worse yet, many ranking schemes use opinion survey data to pad out the list of variables fed into their sometimes obscure sorting formulas. These, especially when they ask presumed experts to provide their opinions about many institutions, are almost always flawed in many ways.

The literature pointing out the errors, difficulties, and fallacies of these rankings is extensive, persuasive, well-documented, and largely ignored by the consuming public for whom the annual appearances of various highly publicized rankings is awaited with the enthusiasm of the results of the latest lottery. The staff of The Center for Measuring University Performance has written about the issue of the mythical number one and other ranking concerns. [<http://mup.asu.edu/publications>] We have looked at more

useful benchmarking projects that offer a much better opportunity, at least for research universities, for improving and assessing the productivity of these institutions. Still, for all our effort, we find that our friends and colleagues still ask us:

“You have all that good data in *The Top American Research Universities* annual report and on your website. Why don't you give us a ranking of the best research universities?”

Taking the high road, we have usually responded:

“Ranking can obscure more than it illustrates by combining quite different things into single indexes that can be misleading and susceptible to manipulation.”

We have always taken the position that what counts is campus-based institutional performance. We collect data on the elements that appear to support superior success among research universities, using only public and verifiable data, and we identify clusters of institutions that appear to deliver one or many performance elements at the highest levels. The difference, in our minds at least, between universities with similar characteristics is quite small, and to put them in a rank order that implies an even distribution along a linear scale can distort the actual differences between similar institutions and hide some important elements that distinguish each of them.

Indeed, the significant distinctions between more or less similar academic institutions will be of variable importance to different consumers. Students, parents, government, industry, foundations, and others will have widely varying opinions on the importance of research, large or small classes, emphasis on science or business or technology, community engagement, and student life activities. For some price is critical, for others the characteristics of the student body matter more. For some small scale is an advantage, while for others the range of alternatives available at a large institution is an important asset. These differences in perspective should help us recognize the overemphasis on rankings that can encourage colleges and universities to invest in activities simply for the purpose of influencing what are, in the end, highly subjective markers of presumed universal quality or effectiveness.

The MUP Center and Rankings

Still, we sometimes feel overwhelmed by the mindless enthusiasm for commercial rankings, although we do recognize the profitable industry they represent and the employment for academics and compilers they provide. So this year, we thought we should throw caution to the wind and experiment with alternative rankings of the *Best American Research Universities* to demonstrate the variable results that different methodologies can have on a ranking, even when, as in this case, the data are all public and verifiable.

To show the variation in ranking that different perspectives on the importance of different measures can cause, we produce not just one ranking, but four. It has always been our belief that people should focus on those aspects of an institutional profile that matter to them. An added complication to ranking exercises is that some things that may make a significant difference to many people are not easily captured in any consistent publicly available data. Indeed, as the examples of the commercial rankings listed below indicate, some of these organizations offer multiple views of the best institutions, demonstrating how much of ranking merit is highly subjective.

In our case, we have constructed four rankings, using our well-developed and validated data set, with different audiences in mind. This exercise has the added advantage of illustrating the importance of the underlying methodology used to weight the various measures in determining the resulting order of institutions in any single-list ranking.

We begin with The MUP Center's nine measures, carefully collected data validated using the experience of over a decade working with this information. These measures are as follows:

Federal Research: This is the amount of money spent annually by the institution from federal sources, most of which are peer reviewed. This data is sourced from the National Science Foundation and is a good indicator of a university's faculty and staff's performance compared to other research universities in peer-reviewed competition.

Total Research: This is the total amount of money spent annually by the institution from all sources on research. This includes not only federal money but all corporate, state, foundation, private, institutional, and other funds spent on research during the year. Some of this may be legislatively provided, some from research contracts with corporations, some from foundation grants. This is a good indicator of the research scale of the institution.

Endowment Assets and Annual Giving: These two indicators speak to the success of the institution in competing for the private funding that supports the university's work. As research and quality instructional programs at all levels almost always require additional support from the university, the ability of an institution to accumulate an endowment (a historical indicator of financial strength) and to sustain its private giving through annual fundraising both indicate a capacity for sustaining a research university.

National Academy Members and Faculty Awards: These two indicators speak to the institution's ability to recruit and retain the most competitive faculty members. Together they speak to both scientific fields and the humanities and social sciences. We do not include Nobel prize winners in large part because there are so few that it is not a good indicator for the many institutions in the country and in part because the work for which a Nobel prize is awarded often reflects work done at another institution in the past. Faculty awards, however, capture the exceptional work of many faculty including those early in their career.

Postdoctoral Appointees: While post-docs are more prevalent in science related fields, they serve the institution in many research roles much like the faculty themselves and represent a quasi-faculty resource.

Doctoral Degrees and Median SAT: Education is, of course, one of the prime functions of a research university and the number of doctoral degrees awarded annually is a useful indicator of advanced education and training. Undergraduate quality is a characteristic of research universities because the quality of the faculty and their research programs attract outstanding undergraduates. In addition, it is clear that exceptionally competitive faculty regard the presence of a high quality undergraduate student body as a major institutional asset. Although the SAT and similar standardized test scores may not accurately predict student success, they are nonetheless indicators closely followed by observers of selective institutions such as the research universities in these rankings.

The group of research universities ranked here includes those institutions with a federal research expenditure of over \$40 million per year. There are 137 of these institutions in the country that meet our criteria. The details of this list are discussed in the materials available on The MUP Center's website. [<http://mup.asu.edu>] A further caveat is in order. We do not include specialized institutions such as health science centers or independent standalone research centers like the Scripps Research Institute and

Woods Hole Oceanographic Institution. We also do not include systems, but only single campus performance for those institutions that meet our criteria included within a university system.

The MUP Center's Four Rankings

With this background we can construct our four rankings. We'll name them as follows:

- Rank I: Power
- Rank II: Resources, Faculty, and Education
- Rank III: Resources and Education
- Rank IV: Education

A description of the methodology used in this exercise is included below and describes the statistical calculations that produced the rankings. We also include references to additional resources related to rankings and their critics.

Rank I, the **Power** ranking of the 137 top American research universities uses all nine measures and weights them equally. This ranking emphasizes the broad performance of research universities in all areas of research, resources, faculty, and education. These high power universities compete against the best in all the areas measured by our nine indicators. Table 1 that includes all 137 research universities highlights the top twenty-five universities in the **Power** ranking in bold numbers. This helps illustrate the changes in rank position among the top twenty-five that result from changes in criteria used in the next three rankings.

The second ranking, Rank II-**Resources, Faculty, and Education**, excludes federal research and total research and weights the remaining measures equally. This ranking takes the position that what really matters for research university quality are the resources available, the performance of the faculty, the scale of postdoctoral engagement, and productivity of doctoral degrees, and the quality of undergraduates. Research, while important, is mostly a function of faculty quality and resources in this ranking's perspective. With this set of criteria, two institutions move up into or down out of the top twenty-five as defined by the Rank I-**Power** list. The changes in the top twenty-five from Rank I to Rank II are marked in gray boxes (illustrating a decline in rank), or black boxes (illustrating an improvement in rank).

However, as this and the subsequent rankings show there is some movement up or down in rank from the order in Rank I to the order in Rank II among all 137 institutions. Given the institutional sensitivity to small changes, it is clear that changes in ranking criteria can produce changes in rank position at all levels. In fact, no university ranks the same in all four rankings included in this table, although some of the changes across the rankings are quite small.

The third ranking, Rank III-**Resources and Education**, excludes the two research measures, the two measures of faculty strength, and the postdoctoral measure. This ranking weights the remaining measures equally. The rationale here is that what matters in a research oriented educational institution are the resources available, the scale of graduate training for doctoral degrees, and the quality of undergraduates. Two institutions move into or fall out of the top twenty-five as defined by the Rank I-**Power** list. Again, many institutions in this ranking change their position, usually by relatively small amounts, compared to the **Power** list.

The final ranking, Rank IV-**Education**, uses two measures, doctorates awarded and median SAT scores, equally weighted. This ranking assumes that what really indicates the quality of a research university is its ability to attract the best undergraduate students possible and produce advanced doctoral graduates. This ranking highlights the competitiveness of research universities in constructing the highest quality undergraduate student body and recognizes the significance of research university training of advanced students for doctoral degrees. Of particular note here, of course, is that seven institutions in the top twenty-five in the **Power** Rank I fall out of this top category while seven other institutions move up into the top twenty-five group. Moreover, even those who stay in the top twenty-five group see their position within this group change significantly. Again, we have marked the positive changes (moving into the top twenty-five group) in black and the negative changes (moving out of the top twenty-five group) in gray.

TABLE 1 – The Best American Research Universities: Four Perspectives on Ranking

Control	Institution	Power Score	Rank I: Power	Resources, Faculty, and Education Score	Rank II: Resources, Faculty, and Education	Resources and Education Score	Rank III: Resources and Education	Education Score	Rank IV: Education
Private	Harvard University	100.0	1	100.0	1	100.0	1	89.7	7
Private	Stanford University	74.5	2	69.2	2	96.4	2	93.8	5
Private	Johns Hopkins University	63.9	3	34.5	9	46.2	12	72.1	24
Private	Yale University	52.8	4	48.4	3	72.3	3	68.8	31
Public	University of Michigan - Ann Arbor	50.7	5	38.8	7	55.4	7	98.4	2
Private	Massachusetts Inst. of Technology	50.6	6	46.1	4	56.6	5	81.4	14
Private	Columbia University	48.1	7	40.6	6	56.8	4	80.1	15
Public	University of California - Berkeley	47.7	8	44.8	5	53.4	9	100.0	1
Public	University of Washington - Seattle	47.1	9	34.4	10	42.0	19	83.0	12
Private	University of Pennsylvania	45.0	10	36.6	8	52.1	10	75.8	20
Public	Univ. of California - Los Angeles	40.1	11	32.1	12	45.6	14	86.4	9
Public	University of Wisconsin - Madison	39.0	12	30.0	14	45.6	13	91.4	6
Private	Duke University	38.9	13	29.8	15	45.3	16	71.3	26
Public	University of California - San Diego	38.0	14	28.4	17	29.6	36	71.3	25
Public	University of Texas - Austin	35.3	15	32.1	13	53.7	8	94.9	4
Private	University of Southern California	34.3	16	29.7	16	51.5	11	82.6	13
Public	Univ. of Minnesota - Twin Cities	34.1	17	27.2	18	41.8	20	85.3	10
Private	Princeton University	33.2	18	34.0	11	56.3	6	66.1	35
Public	Univ. of North Carolina - Chapel Hill	32.1	19	24.7	23	37.5	25	70.4	28
Public	Ohio State University - Columbus	31.0	20	24.1	25	45.4	15	87.4	8
Private	Northwestern University	30.9	21	26.4	20	41.5	21	66.6	33
Public	University of Pittsburgh - Pittsburgh	30.4	22	20.9	30	30.9	33	68.2	32
Private	University of Chicago	29.9	23	26.8	19	42.4	18	69.2	30
Public	Texas A&M Univ. - College Station	28.1	24	23.9	26	43.7	17	79.4	17
Private	Cornell University	28.1	25	24.8	22	40.2	23	73.7	21
Public	Univ. of Illinois - Urbana-Champaign	28.0	26	24.6	24	38.9	24	96.0	3
Private	Washington University in St. Louis	27.6	27	21.2	29	34.6	30	57.8	50
Private	New York University	27.3	28	25.1	21	41.2	22	66.5	34
Public	University of Florida	26.2	29	21.6	28	36.1	27	83.2	11
Private	Emory University	25.8	30	21.7	27	34.4	31	55.6	55
Public	Pennsylvania State Univ. - Univ. Park	24.9	31	19.2	34	32.8	32	76.5	19
Public	University of California - Davis	24.4	32	18.8	36	28.6	39	72.6	22
Public	Georgia Institute of Technology	24.3	33	18.4	38	30.2	35	70.4	27
Private	Vanderbilt University	24.1	34	19.0	35	29.2	37	58.8	48
Public	Purdue University - West Lafayette	23.3	35	20.2	31	34.9	29	77.2	18
Private	California Institute of Technology	22.4	36	19.4	33	24.1	52	54.2	59
Public	University of Maryland - College Park	21.8	37	17.9	39	30.6	34	79.6	16
Public	University of Virginia	21.3	38	20.1	32	37.5	26	64.6	40
Private	Boston University	20.9	39	18.4	37	28.1	42	70.3	29
Public	University of Arizona	20.5	40	15.8	42	27.7	43	60.8	47
Public	Michigan State University	18.3	41	15.9	41	29.0	38	66.1	36
Public	University of Iowa	18.3	42	15.1	44	25.9	48	62.3	44
Public	University of Colorado - Boulder	18.1	43	15.0	45	22.4	62	56.3	54
Public	University of Utah	17.8	44	14.9	46	23.6	56	53.6	61
Public	Rutgers University - New Brunswick	17.1	45	14.5	49	23.8	53	61.4	45
Private	University of Rochester	16.8	46	13.0	56	23.7	54	55.4	56
Public	Arizona State University	16.6	47	15.3	43	28.4	40	72.3	23
Public	University of California - Irvine	15.9	48	14.1	50	23.4	57	61.0	46
Public	North Carolina State University	15.7	49	14.1	51	25.6	50	63.4	42
Private	Case Western Reserve University	15.4	50	11.3	66	22.0	65	49.7	76
Private	University of Notre Dame	15.2	51	16.4	40	35.2	28	55.0	57
Public	Virginia Polytechnic Inst. & State Univ.	15.1	52	12.6	59	25.4	51	65.7	37
Public	University of Cincinnati - Cincinnati	15.1	53	11.7	60	20.9	73	47.6	83
Private	Brown University	15.0	54	14.8	47	28.3	41	54.4	58
Public	University of California - Santa Barbara	14.8	55	14.6	48	23.0	61	56.9	53
Private	Carnegie Mellon University	14.7	56	13.6	53	23.7	55	58.7	49
Public	University of Georgia	13.9	57	13.4	55	25.6	49	65.0	38
Public	University of Illinois - Chicago	13.5	58	10.8	71	19.9	78	53.2	63
Private	University of Miami	13.4	59	11.3	65	23.1	59	48.6	80
Public	University of Colorado - Denver	13.2	60	9.6	82	17.0	96	35.4	117
Private	Dartmouth College	13.0	61	12.7	58	26.5	47	45.5	90
Public	University of Kentucky	12.9	62	10.9	69	21.6	67	53.6	62
Public	Indiana University - Bloomington	12.8	63	13.5	54	27.0	45	64.3	41
Private	Rice University	12.6	64	13.6	52	26.8	46	52.7	64
Public	University of Tennessee - Knoxville	12.4	65	12.9	57	27.1	44	65.0	39
Public	University at Buffalo	12.4	66	10.6	73	20.5	75	52.5	65
Public	University of Alabama - Birmingham	12.1	67	7.2	106	16.7	99	42.0	104
Private	Yeshiva University	11.9	68	10.2	75	18.5	86	42.2	103

TABLE 1 – The Best American Research Universities: Four Perspectives on Ranking (cont.)

Control	Institution	Power Score	Rank I: Power	Resources, Faculty, and Education Score	Rank II: Resources, Faculty, and Education	Resources and Education Score	Rank III: Resources and Education	Education Score	Rank IV: Education
Public	Iowa State University	11.8	69	11.2	67	22.0	66	57.4	51
Public	Florida State University	11.8	70	11.3	64	23.4	58	62.7	43
Public	University of South Florida - Tampa	11.4	71	9.0	87	18.4	87	50.1	75
Private	George Washington University	11.3	72	11.1	68	21.4	69	51.2	70
Public	Washington State University - Pullman	11.2	73	9.7	79	18.9	84	42.6	100
Public	University of Missouri - Columbia	11.2	74	11.5	61	23.1	60	57.3	52
Public	Virginia Commonwealth University	11.2	75	10.9	70	21.6	68	52.3	66
Public	Oregon State University	11.1	76	10.4	74	18.4	88	43.0	96
Public	University of Kansas - Lawrence	10.9	77	11.4	63	22.3	63	50.1	74
Private	Georgetown University	10.7	78	10.6	72	21.1	70	46.4	88
Public	Louisiana State Univ. - Baton Rouge	10.7	79	10.0	77	22.3	64	54.2	60
Public	Colorado State University - Fort Collins	10.5	80	8.0	97	16.7	100	46.8	86
Public	University of Houston - University Park	10.4	81	11.5	62	20.2	77	50.9	71
Public	University of South Carolina - Columbia	10.2	82	10.1	76	20.9	74	51.6	69
Public	University of Hawaii - Manoa	10.1	83	8.0	99	16.1	108	42.9	97
Public	Indiana U.-Purdue U. - Indianapolis	10.1	84	8.5	90	16.3	106	28.7	132
Public	Stony Brook University	10.1	85	9.6	81	20.3	76	51.8	67
Public	University of Nebraska - Lincoln	10.0	86	9.7	80	21.0	72	48.2	81
Public	University of Delaware	9.9	87	9.9	78	19.1	82	48.6	79
Private	Tufts University	9.4	88	9.3	83	19.9	79	49.3	77
Public	University of Massachusetts - Amherst	9.3	89	9.2	84	18.1	90	50.8	72
Public	University of New Mexico - Albuquerque	8.9	90	7.8	102	16.3	103	41.5	106
Public	University of Louisville	8.5	91	8.7	89	17.7	92	42.7	99
Public	University of California - Riverside	8.2	92	8.9	88	16.5	102	46.4	87
Public	Wayne State University	8.2	93	7.1	107	16.2	107	42.8	98
Public	University of Connecticut - Storrs	8.1	94	8.4	93	18.5	85	51.7	68
Public	University of Oregon	8.1	95	9.0	86	18.3	89	41.5	107
Private	Tulane University	8.0	96	7.9	100	17.9	91	44.6	94
Public	University of Oklahoma - Norman	8.0	97	9.1	85	21.0	71	47.4	84
Public	Oklahoma State University - Stillwater	7.9	98	8.0	98	19.0	83	45.2	92
Private	Drexel University	7.8	99	8.4	94	17.6	93	44.0	95
Public	Clemson University	7.8	100	8.4	91	19.3	81	48.9	78
Public	Auburn University	7.5	101	7.9	101	19.5	80	50.4	73
Private	Rensselaer Polytechnic Institute	7.4	102	8.4	92	17.4	94	47.2	85
Public	West Virginia University	7.4	103	7.5	104	16.9	97	40.5	109
Public	Temple University	7.4	104	7.8	103	16.3	105	44.9	93
Private	Brandeis University	7.2	105	8.3	95	17.0	95	42.4	102
Private	Northeastern University	7.2	106	8.0	96	16.8	98	45.4	91
Public	University of Central Florida	6.7	107	7.4	105	16.3	104	48.1	82
Public	University of California - Santa Cruz	6.5	108	6.5	108	14.8	110	42.6	101
Public	Mississippi State University	6.5	109	5.9	113	14.9	109	38.6	111
Public	University of Vermont	6.3	110	6.4	110	12.9	114	36.3	114
Public	University at Albany	6.3	111	5.9	112	13.9	111	41.0	108
Public	George Mason University	5.7	112	6.5	109	16.6	101	45.8	89
Public	Florida International University	5.6	113	6.2	111	13.3	113	39.1	110
Public	Utah State University	5.2	114	4.7	121	12.8	116	35.7	116
Public	San Diego State University	4.9	115	5.6	114	12.8	115	32.3	130
Public	University of New Hampshire - Durham	4.9	116	4.9	119	11.6	125	33.5	126
Public	New Mexico State Univ. - Las Cruces	4.7	117	4.6	122	11.3	128	33.3	127
Public	University of Nevada - Reno	4.6	118	5.4	115	12.7	117	35.9	115
Private	Wake Forest University	4.6	119	3.1	133	3.7	135	0.5	136
Public	University of Rhode Island	4.4	120	4.8	120	11.6	124	34.5	121
Public	Univ. of Maryland - Baltimore County	4.2	121	4.9	118	12.6	118	37.8	112
Public	University of Wyoming	4.1	122	5.0	116	12.6	119	34.8	119
Public	Montana State University - Bozeman	4.0	123	4.2	124	11.4	127	34.0	124
Public	University of Maine - Orono	4.0	124	4.4	123	11.7	122	32.8	128
Public	University of Southern Mississippi	3.8	125	4.9	117	13.7	112	41.6	105
Public	North Dakota State University	3.8	126	4.1	126	11.6	123	34.9	118
Private	University of Dayton	3.6	127	4.0	127	12.1	121	34.2	122
Public	U.S. Air Force Academy	3.5	128	4.2	125	12.6	120	36.6	113
Public	University of Idaho	3.4	129	4.0	128	11.2	130	32.6	129
Public	University of Alabama - Huntsville	3.3	130	3.9	130	11.2	131	34.1	123
Public	New Jersey Institute of Technology	3.3	131	3.9	129	11.4	126	34.6	120
Public	University of North Dakota	3.1	132	3.8	131	11.3	129	33.9	125
Public	Cleveland State University	2.6	133	3.5	132	9.2	133	28.6	133
Public	South Dakota State University	2.2	134	3.0	134	9.5	132	30.0	131
Public	Kansas State University	2.2	135	1.8	135	5.3	134	7.9	134
Public	University of Alaska - Fairbanks	0.5	136	0.0	137	0.0	137	0.0	137
Public	University of Toledo	0.0	137	0.6	136	0.9	136	3.7	135

To illustrate the significant difference the choice of criteria make in determining an institution's position in any ranking, and to highlight the way preferences and values of ranking compilers determine the final rank order, we include a change-in-rank list in Table 2. This shows the difference in rank between the **Power Rank I** and the

Education Rank IV. The range of change is large with some institutions increasing by over 25 places and others declining in position by 25 or more places. A few universities have the same place in the **Power Rank I** and the **Education Rank IV** but different locations in the other two rankings.

TABLE 2 – Rank Shifts: Four Power Rank vs. Education Rank

Institution	Rank I: Power	Rank IV: Education	Change in Rank from Power to Education
Harvard University	1	7	-6
Stanford University	2	5	-3
Johns Hopkins University	3	24	-21
Yale University	4	31	-27
Univ. of Michigan - Ann Arbor	5	2	3
Massachusetts Inst. of Tech.	6	14	-8
Columbia University	7	15	-8
Univ. of California - Berkeley	8	1	7
Univ. of Washington - Seattle	9	12	-3
University of Pennsylvania	10	20	-10
Univ. of California - LA	11	9	2
Univ. of Wisconsin - Madison	12	6	6
Duke University	13	26	-13
Univ. of California - San Diego	14	25	-11
University of Texas - Austin	15	4	11
Univ. of Southern California	16	13	3
Univ. of Minnesota - Twin Cities	17	10	7
Princeton University	18	35	-17
U. of North Carolina - Chapel Hill	19	28	-9
Ohio State Univ. - Columbus	20	8	12
Northwestern University	21	33	-12
Univ. of Pittsburgh - Pittsburgh	22	32	-10
University of Chicago	23	30	-7
Texas A&M U. - College Station	24	17	7
Cornell University	25	21	4
U. of Illinois - Urbana-Champaign	26	3	23
Washington University in St. Louis	27	50	-23
New York University	28	34	-6
University of Florida	29	11	18
Emory University	30	55	-25
Penn State Univ. - Univ. Park	31	19	12
University of California - Davis	32	22	10
Georgia Institute of Technology	33	27	6
Vanderbilt University	34	48	-14
Publicurdue Univ. - West Lafayette	35	18	17
California Institute of Technology	36	59	-23
Univ. of Maryland - College Park	37	16	21
University of Virginia	38	40	-2
Boston University	39	29	10
University of Arizona	40	47	-7
Michigan State University	41	36	5
University of Iowa	42	44	-2
University of Colorado - Boulder	43	54	-11
University of Utah	44	61	-17
Rutgers Univ. - New Brunswick	45	45	0
University of Rochester	46	56	-10
Arizona State University	47	23	24
University of California - Irvine	48	46	2
North Carolina State University	49	42	7
Case Western Reserve University	50	76	-26
University of Notre Dame	51	57	-6
Virginia Polytech. Inst. & St. Univ.	52	37	15
University of Cincinnati - Cincinnati	53	83	-30
Brown University	54	58	-4
Univ. of California - Santa Barbara	55	53	2
Carnegie Mellon University	56	49	7
University of Georgia	57	38	19
University of Illinois - Chicago	58	63	-5

Institution	Rank I: Power	Rank IV: Education	Change in Rank from Power to Education
University of Miami	59	80	-21
University of Colorado - Denver	60	117	-57
Dartmouth College	61	90	-29
University of Kentucky	62	62	0
Indiana University - Bloomington	63	41	22
Rice University	64	64	0
University of Tennessee - Knoxville	65	39	26
University at Buffalo	66	65	1
Univ. of Alabama - Birmingham	67	104	-37
Yeshiva University	68	103	-35
Iowa State University	69	51	18
Florida State University	70	43	27
University of South Florida - Tampa	71	75	-4
George Washington University	72	70	2
Washington State Univ. - Pullman	73	100	-27
University of Missouri - Columbia	74	52	22
Virginia Commonwealth University	75	66	9
Oregon State University	76	96	-20
University of Kansas - Lawrence	77	74	3
Georgetown University	78	88	-10
Louisiana State U. - Baton Rouge	79	60	19
Colorado State Univ. - Fort Collins	80	86	-6
University of Houston - Univ. Park	81	71	10
Univ. of South Carolina - Columbia	82	69	13
University of Hawaii - Manoa	83	97	-14
Indiana U.-Purdue U.-Indianapolis	84	132	-48
Stony Brook University	85	67	18
University of Nebraska - Lincoln	86	81	5
University of Delaware	87	79	8
Tufts University	88	77	11
Univ. of Massachusetts - Amherst	89	72	17
Univ. of New Mexico - Albuquerque	90	106	-16
University of Louisville	91	99	-8
University of California - Riverside	92	87	5
Wayne State University	93	98	-5
University of Connecticut - Storrs	94	68	26
University of Oregon	95	107	-12
Tulane University	96	94	2
University of Oklahoma - Norman	97	84	13
Oklahoma State Univ. - Stillwater	98	92	6
Drexel University	99	95	4
Clemson University	100	78	22
Auburn University	101	73	28
Rensselaer Polytechnic Institute	102	85	17
West Virginia University	103	109	-6
Temple University	104	93	11
Brandeis University	105	102	3
Northeastern University	106	91	15
University of Central Florida	107	82	25
Univ. of California - Santa Cruz	108	101	7
Mississippi State University	109	111	-2
University of Vermont	110	114	-4
University at Albany	111	108	3
George Mason University	112	89	23
Florida International University	113	110	3
Utah State University	114	116	-2
San Diego State University	115	130	-15
Univ. of New Hampshire - Durham	116	126	-10

TABLE 2 – Rank Shifts: Four Power Rank vs. Education Rank (cont.)

Institution	Rank I: Power	Rank IV: Education	Change in Rank from Power to Education
New Mexico St. Univ. - Las Cruces	117	127	-10
University of Nevada - Reno	118	115	3
Wake Forest University	119	136	-17
University of Rhode Island	120	121	-1
U. of Maryland - Baltimore County	121	112	9
University of Wyoming	122	119	3
Montana State Univ. - Bozeman	123	124	-1
University of Maine - Orono	124	128	-4
University of Southern Mississippi	125	105	20
North Dakota State University	126	118	8
University of Dayton	127	122	5
U.S. Air Force Academy	128	113	15
University of Idaho	129	129	0
University of Alabama - Huntsville	130	123	7
New Jersey Institute of Technology	131	120	11
University of North Dakota	132	125	7
Cleveland State University	133	133	0
South Dakota State University	134	131	3
Kansas State University	135	134	1
University of Alaska - Fairbanks	136	137	-1
University of Toledo	137	135	2

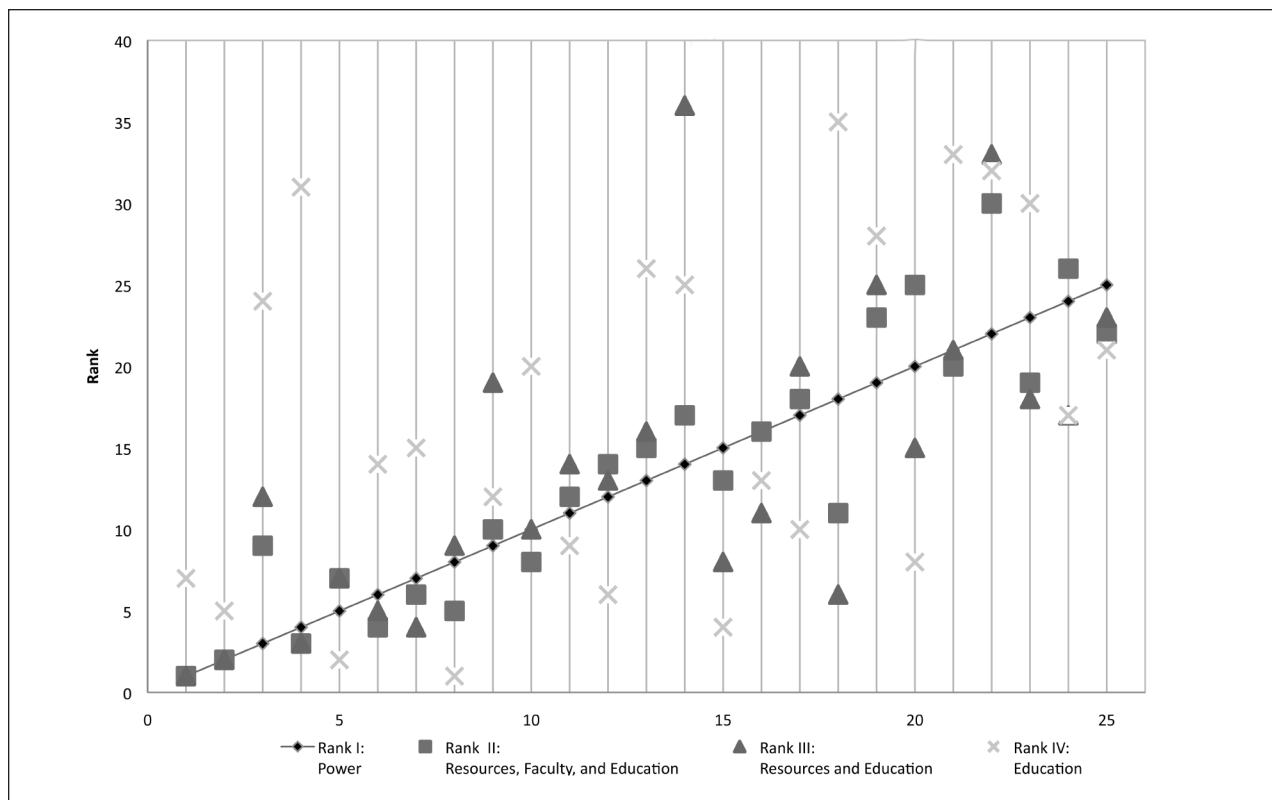
University at 25 (see Table 1). The other symbols represent the position of each of the top twenty-five within the other three rankings. Even in this high performing group, the variation in position depending on the indicators used in a ranking is easily visible.

What do the *Best American Research University Rankings* tell us? Single list ranking is a fool’s game, the results of which are highly dependent on the way the ranking compilers use and weight the data, which, in every case, is done in accord with the biases, opinions, and values of the compilers. Unlike the won-lost records of football teams, the league tables of universities reflect only what we want them to show, not some impartial score resulting from a visible unambiguous performance within a highly structured environment.

Still it is useful to explore the mechanics of constructing rankings, and The Center for Measuring University Performance website provides all the data needed to rank and rate research universities using any combination of a wide range of data points and preferences. The resulting customized ranking will be a better match to individual values about higher education institutions than the commercial rankings.

Figure 3 provides a good illustration of the fluctuation in rank for each university within the top twenty-five. The blue line represents the **Power** rank of the top twenty-five institutions, ranging from Harvard at number 1 and Cornell

FIGURE 3 – Variation in Four Ranks Among Power Rank Top 25



Methodological Notes

The [Top American Research Universities: Four Perspectives on Ranking](#) is based on the *Top American Research Universities* tables available on The Center for Measuring University Performance website. As mentioned above, the four rankings use the institutions with at least \$40 million in federal research expenditures per year, excluding special purpose units and medical centers. This gives a data set of 137 institutions.

We then calculate each institution's z-score for each of the nine indicators. A z-score is a simple statistic used to standardize the data so that different types may be combined into a single score. A positive z-score means the institution's data point is above average for the group of 137 institutions, a negative z-score means it is below average, and a z-score of zero means that the institution's data point is equal to the average of the group.

Next we sum the institution's z-scores for the indicators relevant to each ranking. To make comparisons easier we recalculate the summed z-scores to range from 0 (worst) to 100 (best). This is the score reported in the accompanying tables. Scores are then ranked from high to low, with 1 the top rank and 137 the lowest rank.

The most important element here is that the underlying data, coming from The Top American Research Universities project at The Center for Measuring University Performance have been carefully collected from reliable sources and, wherever there are aggregated or missing data, The MUP Center staff has carefully adjusted the data and included a methodological note on our website.

For further discussion of these issues of data please see the publications included on The MUP Center website at [<http://mup.asu.edu>].

Further Information on College and University Ranking

For those interested in college and university ranking activity, the best starting point is always the University of Illinois (Urbana-Champaign) library's informative review at [College and University Rankings](http://www.library.illinois.edu/sshel/specialcollections/rankings) [<http://www.library.illinois.edu/sshel/specialcollections/rankings>].

The following items provide a very good perspective on the continuing conversation about the pitfalls of university and college rankings, the challenges of methodology, and the pernicious effects of the ranking craze. This sampler includes items from 2008 to 2014.

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A Sampler of Rankings

The following are but a sample of some of the more prominent college and university rankings. A review of these will make clear how idiosyncratic these systems are. All seek to provide a unique view, or in many cases multiple views of university performance seen from a wide variety of perspectives.

Money Magazine: Top 50 Colleges At a Glance [<http://time.com/money/3024906/moneys-best-colleges-top-50/>] offers online a variety of ways of sorting and categorizing institutions as they indicate on their website "In addition to our overall ranking, we've sorted schools by additional criteria (public vs. private, liberal arts, affordability, and more...."

U.S. News & World Report: National Universities Rankings [<http://colleges.usnews.rankingsandreviews.com/best-colleges/rankings/national-universities>] is the portal to the US News education site that offers many ways to view colleges through their ranking methodology. It reflects the significant business of providing advice and guidance to prospective college students and their parents.

U.S. News & World Report: Best Global Universities Rankings [<http://www.usnews.com/education/best-global-universities/rankings>] reflects the U.S. News & World Report entrance into the growing international university ranking marketplace.

Kiplinger: Best Values in Public Colleges, 2014 [<http://www.kiplinger.com/article/college/T014-C000-S002-best-values-in-public-colleges-2014.html>] offers a number of ways of manipulating their data even after it identifies what it regards as the best values. This site, while identifying what its compilers think are the best of the best, also offer ways for individuals to seek their own college match using different criteria.

Forbes: America's Top Colleges [<http://www.forbes.com/top-colleges/list/>] is another list that offers various ways to approach college ranking results.

QS World University Rankings 2013 [<http://www.topuniversities.com/university-rankings/world-university-rankings/2013>] takes an international view of world universities and also offers various ways of sorting and understanding the underlying data. They announce the purpose is to “compare the world’s top universities, sort by region and subject, find the best universities in your academic field, and create your own personalized ranking based on what matters most to you.”

CWTS Leiden Ranking 2014 [<http://www.leidenranking.com/ranking/2014>] provides a very sophisticated website that permits the construction of world university rankings using a wide range of criteria and selection mechanisms. It describes its focus as “The CWTS Leiden Ranking 2014 ranks the 750 universities in the world with the largest contribution in international scientific journals in the period of 2009–2012. The ranking is based on data from the Web of Science bibliographic database produced by Thomson Reuters.”

Academic Ranking of World Universities [<http://www.shanghairanking.com/ARWU2013.html>] otherwise known as the Shanghai ranking offers scores from the most recent ranking back to 2003. Its website identifies its purpose as “ARWU uses six objective indicators to rank world universities, including the number of alumni and staff winning Nobel Prizes and Fields Medals, number of highly cited researchers selected by Thomson Reuters, number of articles published in journals of Nature and Science, number of articles indexed in Science Citation Index - Expanded and Social Sciences Citation Index, and per capita performance of a university.”

The Times Higher Education University Rankings [<http://www.timeshighereducation.co.uk/world-university-rankings/2013-14/world-ranking>] provides its own view of its work as “The Times Higher Education World University Rankings 2013-2014 powered by Thomson Reuters are the only global university performance tables to judge world class universities across all of their core missions - teaching, research, knowledge transfer and international outlook. The top universities rankings employ 13 carefully calibrated performance indicators to provide the most comprehensive and balanced comparisons available....” Its website like the others above, offers a discussion of methodology and various commentaries on the nature of university performance. It has rankings from 2010-11 to the most recent versions.

Niche Rankings: 2015: College Rankings [<https://colleges.niche.com/rankings/>] this enterprising ranking organization produces multiple rankings of colleges that express a wide range of preferences. Niche Rankings offers the following perspectives on its website: *Best Academics Best Administration Best Athletics Best Campus Best Campus Food Best Dorms Best Greek Housing Best Greek Life Best Location Best Off-Campus Dining Best Off-Campus Housing Best Overall Best Parking Best Party Schools Best Students Best Students - Girls Best Students - Guys Best Technology Best Transportation Best Weather Friendliest Students Hardest to Get In Hottest Girls Hottest Guys Largest Colleges Most Applicants Most Diverse Campus Most Drug-Free Campus Most Expensive Safest Campus Smartest Students.*