

The Methodology of the NRC Doctoral Program Assessment

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National Research Council

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- **Richard P. Wheeler***
(English)
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When the ratings come out, what will the university receive to explain the range of rankings for each of its programs?

1. A table comparing the data from its programs to the average values for the fields as a whole.
2. A table showing, for each program, how the first quartile rating was calculated and the ranking that corresponded to it.
3. A table showing, for each program, how the third quartile rating was calculated and the ranking that corresponded to it

These tables will be sent to your institutional coordinator **BEFORE** the rankings are made public.

When the report is released

- All the ranges of rankings for all the programs in each field will be available on the Web in Excel spreadsheets
- All the data provided by all the programs will be available on the Web, provided the cell sizes aren't too small.
- There will be a separate spreadsheet with the ratings and rankings, coefficients, and the mean values of the 20 variables in each field.

The Twenty Key Variables

- Publications
- Citations (exc. Humanities)
- Percent faculty with grants
- Awards per faculty
- Percent 1st Yr. Full Support
- Percent 1st Yr. National Fellowship and internal support
- Percent Completing in 6 yrs. or less (8 yrs. for humanities)
- Median Time to degree
- Students with Academic Plans
- Collects Outcomes data
- Percent Faculty Minority
- Percent Faculty Female
- Percent Students Minority
- Percent Students Female
- Percent Students International
- Percent Interdisciplinary
- Average GRE-Q
- Number of PhDs 2002-2006
- Student Workspace
- Student Health Insurance
- Student Activities

Standardized Program Values and Range of Combined Coefficients						
Institution Name: xxx						
Program Name: yyy						
Description	Variable	Program Value*	Program Value Standardize	Combined Coefficients**		
				Minus 1 SD		Plus 1 SD
Publications per Allocated Faculty	V1	1.074	2.180	0.118	to	0.132
Cites per Publication	V2	1.171	-0.234	0.276	to	0.307
Percent of Faculty with Grants	V3	25.50%	-0.583	0.084	to	0.091
Percent Faculty Interdisciplinary	V4	5.90%	-0.641	n.s.#		n.s.#
Percent Non-Asian Minority Faculty	V5	7.70%	0.547	n.s.#		n.s.#
Percent Female Faculty	V6	12.50%	-0.440	n.s.#		n.s.#
Awards per allocated faculty	V7	0	-0.546	0.043	to	0.060
Average GRE-Q	V8	746	-0.165	0.092	to	0.096
Percent 1st yr. students w/ full support	V9	100.00%	0.980	0.036	to	0.056
Percent 1st yr students with portable fellowships+ inst. support	V10	0.00%	-0.544	0.021	to	0.033
Percent Non-Asian Minority Students	V11	10.00%	0.069	n.s.#		n.s.#
Percent Female Students	V12	44.40%	0.678	-0.038	to	-0.030
Percent International Students	V13	53.30%	-0.509	n.s.#		n.s.#
Average PhDs 2002 to 2006	V14	5.4	-0.355	0.120	to	0.144
Percent Completing within 6 years	V15	27.60%	-0.638	n.s.#		n.s.#
Time to Degree Full and Part Time	V16	5.67	0.232	-0.028	to	-0.017
Percent students in Academic	V17	11.10%	-1.405	0.049	to	0.065
Student Work Space	V18	1	1	n.s.#		n.s.#
Health Insurance	V19	1	1	n.s.#		n.s.#
Number of student activities of	V20	17	0.439	0.026	to	0.037

Description	Variable	Program Value*	Program Value Standardize	Combined Coefficients**		
				Minus 1 SD		Plus 1 SD
Publications per Allocated Faculty	V1	1.074	2.180	0.118	to	0.132
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Time to Degree Full and Part Time	V16	5.67	0.232	-0.028	to	-0.017
Percent students in Academic Positions	V17	11.10%	-1.405	0.049	to	0.065
Student Work Space	V18	1	1	n.s.#		n.s.#
Health Insurance	V19	1	1	n.s.#		n.s.#
Number of student activities offered	V20	17	0.439	0.026	to	0.037

*Col 3 is based on data submitted by the program or calculated from these data.

Standardized Program Values and Range of Combined Coefficients						
Institution Name: xxx						
Program Name: yyy						
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Percent of Faculty with Grants	V3	25.50%	-0.583	0.084	to	0.091
Percent Faculty Interdisciplinary	V4	5.90%	-0.641	n.s.#		n.s.#
Percent Non-Asian Minority Faculty	V5	7.70%	0.547	n.s.#		n.s.#
Percent Female Faculty	V6	12.50%	-0.440	n.s.#		n.s.#
Awards per allocated faculty	V7	0	-0.546	0.043	to	0.060
Average GRE-Q	V8	746	-0.165	0.092	to	0.096
Percent 1st yr. students w/ full support	V9	100.00%	0.980	0.036	to	0.056
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Percent Non-Asian Minority Students	V11	10.00%	0.069	n.s.#		n.s.#
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Percent students in Academic Positions	V17	11.10%	-1.405	0.049	to	0.065
Student Work Space	V18	1	1	n.s.#		n.s.#
Health Insurance	V19	1	1	n.s.#		n.s.#
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Cites per Publication	V2	1.171	-0.234	0.276	to	0.307
Percent of Faculty with Grants	V3	25.50%	-0.583	0.084	to	0.091
Percent Faculty Interdisciplinary	V4	5.90%	-0.641	n.s.#		n.s.#
Percent Non-Asian Minority Faculty	V5	7.70%	0.547	n.s.#		n.s.#
Percent Female Faculty	V6	12.50%	-0.440	n.s.#		n.s.#
Awards per allocated faculty	V7	0	-0.546	0.043	to	0.060
Average GRE-Q	V8	746	-0.165	0.092	to	0.096
Percent 1st yr. students w/ full support	V9	100.00%	0.980	0.036	to	0.056
Percent 1st yr students with portable fellowships	V10	0.00%	-0.544	0.021	to	0.033
Percent Non-Asian Minority Students	V11	10.00%	0.069	n.s.#		n.s.#
Percent Female Students	V12	44.40%	0.678	-0.038	to	-0.030
Percent International Students	V13	53.30%	-0.509	n.s.#		n.s.#
Average PhDs 2002 to 2006	V14	5.4	-0.355	0.120	to	0.144
Percent Completing within 6 years	V15	27.60%	-0.638	n.s.#		n.s.#
Time to Degree Full and Part Time	V16	5.67	0.232	-0.028	to	-0.017
Percent students in Academic	V17	11.10%	-1.405	0.049	to	0.065
Student Work Space	V18	1	1	n.s.#		n.s.#
Health Insurance	V19	1	1	n.s.#		n.s.#
Number of student activities offered	V20	17	0.439	0.026	to	0.037

Table 5-2a Sample First Quartile Ranking Calculation

Institution Name: xxx

Program Name: yyy

Description	Variable	Program Value*	Standardized Program Value with Variation+	Combined Coefficient [@]	Product Col 4 x Col 5
Publications per Allocated Faculty	V1	1.074	1.784	0.130	0.231
Cites per Publication	V2	1.171	-0.269	0.294	-0.079
Percent of Faculty with Grants	V3	25.5%	-0.596	0.085	-0.051
Percent Faculty Interdisciplinary	V4	5.9%	-0.581	n.s. #	n.c. #
Percent Non-Asian Minority Faculty	V5	7.7%	0.444	n.s. #	n.c. #
Percent Female Faculty	V6	12.5%	-0.511	n.s. #	n.c. #
Awards per allocated faculty	V7	0	-0.290	0.038	-0.011
Average GRE-Q	V8	746	-0.286	0.091	-0.026
Percent 1st yr. students w/ full support	V9	100%	1.432	0.044	0.064
Percent 1st yr students with portable fellowships+Inst. support	V10	0.0%	-0.489	0.023	-0.011
Percent Non-Asian Minority Students	V11	10.0%	0.062	n.s. #	n.c. #
Percent Female Students	V12	44.4%	0.561	-0.029	-0.016
Percent International Students	V13	53.3%	-0.018	n.s. #	n.c. #
Average PhDs 2002 to 2006	V14	5.4	-0.379	0.152	-0.058
Percent Completing within 6 years	V15	27.6%	-0.574	n.s. #	n.c. #
Time to Degree Full and Part Time	V16	5.67	0.017	-0.026	0.000
Percent students in Academic Field	V17	11.1%	-1.365	0.063	-0.086
Student Work Space	V18	1	1.000	n.s. #	n.c. #
Health Insurance	V19	1	1.000	n.s. #	n.c. #
Number of student activities offered	V20	17	-0.427	0.025	-0.011
Average Rating (total of column 6)					-0.054
Program Ranking for this rating = 56					

Table 5-2b Sample Third Quartile Ranking Calculation

Institution Name: xxx

Program Name: yyy

Description	Variable	Program Value*	Standardized Program Value with Variation+	Combined Coefficient @	Product of Col 4 and col. 5
Publications per Allocated Faculty	V1	1.074	2.765	0.134	0.371
Cites per Publication	V2	1.171	-0.246	0.267	-0.066
Percent of Faculty with Grants	V3	25.5%	-0.709	0.073	-0.051
Percent Faculty Interdisciplinary	V4	5.9%	-0.669	n.s. #	n.c. #
Percent Non-Asian Minority Faculty	V5	7.7%	0.515	n.s. #	n.c. #
Percent Female Faculty	V6	12.5%	-0.314	n.s. #	n.c. #
Awards per allocated faculty	V7	0	-0.439	0.050	-0.022
Average GRE-Q	V8	746	-0.305	0.089	-0.027
Percent 1st yr. students w/ full support	V9	100%	0.385	0.054	0.021
Percent 1st yr students with portable fellowships+Inst. Support	V10	0.0%	-0.585	0.031	-0.018
Percent Non-Asian Minority Students	V11	10.0%	0.226	n.s. #	n.c. #
Percent Female Students	V12	44.4%	0.083	-0.043	-0.004
Percent International Students	V13	53.3%	-0.190	n.s. #	n.c. #
Average PhDs 2002 to 2006	V14	5.4	-0.196	0.121	-0.024
Percent Completing within 6 years	V15	27.6%	-0.725	n.s. #	n.c. #
Time to Degree Full and Part Time	V16	5.67	-0.439	-0.031	0.014
Percent students in Academic Position	V17	11.1%	-1.293	0.083	-0.108
Student Work Space	V18	1	1.000	n.s. #	n.c. #
Health Insurance	V19	1	1.000	n.s. #	n.c. #
Number of student activities offered	V20	17	-0.058	0.024	-0.001
Average Rating (total of column 6)					0.085
Program Ranking for this rating = 45					

Sources of Data

- Institutions and Programs
 - Institutional practices, program characteristics, faculty and student demographics, faculty lists and lists of advanced students in 5 fields
- Faculty
 - Characteristics (work history, publication identification data, demographics, c.v.'s, importance to quality of program characteristics)
- Existing data
 - Publications and citations (ISI)
 - Ph.D. post-graduation plans (NSF)

The Twenty Key Variables

- Publications
- Citations (exc. Humanities)
- Percent faculty with grants
- Awards per faculty
- Percent 1st Yr. Full Support
- Percent 1st Yr. National Fellowship and institutional support
- Percent Completing in 6 yrs. or less (8 yrs. for humanities)
- Median Time to degree
- Students with Academic Plans
- Collects Outcomes data
- Percent Faculty Minority
- Percent Faculty Female
- Percent Students Minority
- Percent Students Female
- Percent Students International
- Percent Interdisciplinary
- Average GRE-Q
- Number of PhDs 2002-2006
- Student Workspace
- Student Health Insurance
- Student Activities

■ Research Activity

■ Student Effectiveness and Outcomes

■ Diversity of the Academic Environment

■ Not included in dimensional measures

Weights

Two ways of getting at importance

1. Directly—asked faculty on the faculty questionnaire to choose most important of the twenty variables
2. Regression based: A sample of faculty rated a sample of programs in each field. These ratings were regressed on the 20 variables. The coefficients were the regression-based weights.
3. Combined the weights obtained in 1) and 2).

Variability in Values of Weights and Data

Weights

Took 500 samples of weights, each using half the raters.

Data

Obtained a distribution of variable values, either from annual values provided on the questionnaires, or from taking $\pm 10\%$

Statistical

Calculated the standard error for each regression

Obtaining the Range of Rankings

- Calculated 500 ratings for each program and ordered these from highest to lowest across all programs in a field.
- Constructed a “range of rankings” that showed the middle half of the calculated rankings (the interquartile range).

Overall Rating AND Dimensional Measures

- Student Treatment and Outcomes
- Diversity
- Scholarly Productivity of Program Faculty

The Dimensional Measures add information to the overall rankings

Obtaining Dimensional Measures

- In each of the 3 dimensions, the weights were re-normalized to add up to one. Then they were applied to the data.
- This weighted average yielded the measure.
- Each of these measures also takes into account rater and data variability.

Dimensional Rankings for our Sample Program

- Overall Measure: 45-56
- Research Activity: 21-31
- Student Support and Outcomes: 74-87
- Diversity of the Academic Environment 64-77

One more example from Appendix G

- Overall Measure: 7 to 8
- Research Activity: 7 to 9
- Student support and Outcomes: 1 to 4
- **Diversity of the Academic Environment: 106 to 109**

When will the Report and Database be Released?

With the publication of the Methodology Guide, we have completed a major milestone. The NRC and its committee feel an enormous obligation to produce data and rankings that are of the highest quality possible. Striving for this objective requires careful review of the data and rankings for over 5000 programs. This has already taken considerable time and is nearing completion. The committee must also finish summarizing the most important findings from the data, as well as discuss the strengths and shortcomings of the methodology for incorporation in the final report. The last step of the process is for the final report to undergo the Academy's rigorous review. We are working to complete all this work as expeditiously as possible.

To Learn More About the Study

<http://sites.nationalacademies.org/pga/Resdoc/index.htm>

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