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ABSTRACT

Two decades following the publication of David G. Brown's "Criteria for Pruning Programs," (which recognized that traditional financial support to higher education was decreasing and proposed 10 guidelines for evaluating existing programs) a study was developed to determine what criteria are actually being used by comprehensive universities and state coordinating boards to determine which programs to reduce or eliminate. The study looks at the manner in which academic administrators perceive the relative value of each criterion in an ideal evaluation system, recognizing that this might differ a bit from what is happening in practice. A questionnaire was developed that operationalized Brown's guidelines for evaluating programs for possible reduction. The original criteria were modified to include centrality, critical mass, complementariness, program vitality, substitutability or duplication, cost benefit analysis, quality, demand, and uniqueness. Surveys were distributed to the vice chancellors for academic affairs of the 50 state higher education boards that are members of the State Higher Education Executive Officers, and 76 were distributed to public universities represented in the 50 states. It is concluded that the criteria suggested by Brown are still relevant today. The findings verify that Brown's nine modified criteria are the key factors used at both research university and state coordinating board levels for decisions resulting in program reduction or elimination. Tables are included along with a copy of the questionnaire and a listing of the institutions. (SM)

CRITERIA FOR PRUNING ACADEMIC PROGRAMS: ACTUAL VS. IDEAL

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CRITERIA FOR PRUNING ACADEMIC PROGRAMS: ACTUAL VS. IDEAL

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In the 1960's, program review was considered a routine, comprehensive process designed solely to strengthen existing academic programs.[1] Increased financial and political pressures for the efficient use of resources, the proliferation of degree programs at all levels, the changing job market for graduates,[2] and a general concern about the quality of undergraduate education have altered the role of the program review process. Higher education has moved into an era described by Mortimer and Tierney as "The Three R's...: Reduction, Reallocation, and Retrenchment."[3]

David G. Brown's insightful, progressive posture as noted in "Criteria for Pruning Programs," published in the Educational Record in 1970, provides a touchstone for academia today as higher education struggles to respond to a changing society. Brown recognized that traditional financial support to higher education was decreasing. As a

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result, he predicted "new ways must be found to finance new ventures. One way is the reallocation of funds within the university."[4] Brown proposed ten guidelines for evaluating existing programs with the objective of eliminating those programs that were found to be "ineffective, inefficient, or unproductive."[5]

Nearly two decades following the publication of Brown's ten criteria, it seemed appropriate to determine what criteria actually are being used by comprehensive universities and state coordinating boards to determine which programs are to be reduced or eliminated. Of additional interest was the manner in which academic administrators perceived the relative value of each criterion in an ideal evaluation system, recognizing that this might differ somewhat from what is happening in practice.

Research Methodology

A questionnaire was developed which operationalized Brown's guidelines for evaluating programs for possible reduction. Brown's original criteria were modified and expanded to include the following nine criteria: centrality, critical mass, complementariness, substitutability or duplication, cost benefit analysis, program vitality, quality, demand, and uniqueness. The questionnaire consisted of two sections: Part I inquired about the practical use of the nine designated program reduction criteria using a seven point rating scale (ranging from "unimportant" to "essential.") In Part II, again using the graduated seven point scale, respondents were asked to rate the nine criteria according to their perceptions of optimum or ideal use for program reduction or elimination. Both sections afforded respondents the opportunity to expand their responses or to add other criteria for the evaluation of programs.

An additional factor in the analysis was the comparison of the perceptions and use of program reduction criteria between comprehensive university administrators and their state coordinating board counterparts. Both levels of higher education administration are intimately concerned and involved with program evaluation. The questionnaire was

designed to ferret out differences in the use of program review guidelines or any discrepancies in how such criteria are perceived by chief academic officers at the university level and academic vice chancellors at the system level.

Surveys were distributed to the vice chancellors for academic affairs of the 50 state higher education boards that are members of the State Higher Education Executive Officers (SHEEO). Similarly, 76 questionnaires were distributed to public universities represented in the 50 states. Where possible, the two top public research universities for each state were included in the study.*

Institutional Findings (See Table A for a complete listing of universities' ratings and rankings.)

Fifty-three (70%) of the original 76 universities responded to the survey representing 39 states. The criterion centrality received the highest rating from the chief academic officers in both Parts I and II, actual and ideal. Centrality received an average rating of 6.3 and 6.6, respectively, on the seven point scale. Similarly, quality was ranked second in both the actual and ideal environments, varying only .5 point. Indicative of their relative importance in formulating program reduction decisions, both centrality and quality received the largest number of "7" ratings in both sections of the survey.

The first major discrepancy between actual practice and the ideal emerged when the third-place factors were compared. Academic vice presidents indicated that while demand ideally should rank far down the list of criteria used in determining whether programs should be reduced or eliminated (eighth out of nine), they said it is third most important in actual practice with an average rating of 5.3.

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* Appendix A lists the 76 institutions selected to participate.

Academic vice presidents indicated that seven of the nine criteria would receive greater weight in an ideal world with vitality and quality receiving the greatest increases. In addition to indicating that demand receives too much weight in program reduction decisions, the academic administrators noted that cost analysis, in practice, receives undue emphasis as well. In an optimum setting, cost analysis declined from a seventh place ranking to last place.

State System Findings (See Table B for a complete listing of state systems' ratings and rankings.)

The top-rated criterion differed between actual and ideal according to the 33 (66%) state-system academic vice chancellors responding to the survey. The administrators cited quality as being the preferred criterion with an average rating of 6.1. In practice, centrality and demand received the greatest emphasis in program reduction decisions both scoring 5.5; in the ideal, centrality ran a close second to quality, with an identical average rating (6.1), but a weighted rating of two fewer points. Once again, demand did not fare as well in the ideal ranking, plummeting to sixth place.

Critical mass received high marks from the vice chancellors on both sides of the survey -- actual and ideal. Critical mass received a third place ranking behind the tied criteria of centrality and demand in Part I of the survey with an average rating of 5.0. In the ideal ranking, critical mass ranked third with an increased average rating of 5.7. Vitality varied one rating place - fifth place in actual practice vs. fourth place in ideal. Uniqueness maintained the same ranking on both sides of the aisle --last place.

Quality jumped three places in the ideal world moving from fourth to first place, while cost analysis declined one position going from sixth to seventh place. Substitutability increased in stature in the optimum environment by two ranks. Complementariness finished in the same position (sixth place) in both parts of the survey.

Academic vice chancellors indicated that eight of the nine criteria would receive greater weight in an ideal environment with critical mass and centrality receiving the greatest increases. (Paradoxically, centrality moved down in the rankings between real and optimum.) Demand was cited as the only criterion which receives too much emphasis in actual program reduction decisions.

Comparison of Findings for Universities and State Systems (See Table C for an aggregate comparison of the responses of the universities and state systems.)

While a number of similarities are readily apparent in the responses of the academic administrators representing comprehensive universities and state systems, subtle differences are also evident. In general, individual criteria in the ideal realm received greater emphasis at both the university and state system level, the only exceptions being demand which was reduced in importance at both administrative levels. Centrality was ranked number one in the practical realm by both universities and state systems. It retained the first place ranking in the universities' ideal world, but was nosed out for the number one spot by quality at the system level. Vitality received a fourth place ranking in practical application by university administrators and a fifth place position at the system level. In the ideal, vitality advanced one position in both academic settings. Uniqueness followed a somewhat similar route, finishing last place in the practical realm for both groups. In the ideal environment, uniqueness maintained the ninth place ranking by vice chancellors, but advanced to seventh place from a university perspective.

Cost analysis was more important to vice chancellors in both the real and ideal worlds. Cost analysis placed ninth in the ideal rating and seventh place in the actual scale by the vice presidents compared to seventh and sixth place, respectively, by the vice chancellors. Similarly, critical mass was viewed as more essential to program reduction decisions by state systems than by universities in both sections, real and

ideal. Conversely, university academic officials saw complementariness as more important in both environments than their state system couterparts.

Vice chancellors and vice presidents generally gave greater weight to the various criteria in the ideal setting contrasted to the actual. However, the state system respondents were more discriminating among the criteria. The differences in average ratings between the actual and ideal were greater among the systems officers.

Conclusions

A number of conclusions can be drawn from survey results. First, the criteria as suggested by David G. Brown in 1970, are still relevant today. The findings verify that Brown's nine criteria, as modified by survey authors, are the key factors used at both research university and state coordinating board levels for decisions resulting in program reduction or elimination. Specifically, 68% of the vice presidents' ratings of the nine criteria were level 5 or higher (out of a possible 7) on the practical realm of the survey, with 72% of the ratings scored 5 or above in the ideal realm. Sixty-two percent of the vice chancellors' ratings were level 5 or above in the first section, and 75% of the ratings were 5 or above in the second section.

The average change between the actual and ideal use of the program reduction criteria is not significant at either academic level. The state systems' officers indicate a slightly greater dissatisfaction with the applied criteria. In an ideal world, the weight given the program reduction/elimination criteria would vary less than one-half point, revealing that the academic leaders are satisfied with the current use of the program reduction criteria.

The vice chancellors tended to give lower ratings to the criteria as a whole in both parts of the survey, though the relative rankings of criteria were not substantially different. One noteworthy exception was the criterion of demand. The demand for a program is of greater importance to the vice chancellors than to the vice presidents.

However, it is the commonality of the responses between the two groups that is most striking. Thus, one may conclude that academic administrators at both university and state levels perceive the practical as well as optimum use of program reduction criteria very much the same.

Though small, a couple of differences in actual and optimum criteria are worth noting. Demand should receive less emphasis in formulating program reduction judgments. Conversely, quality and vitality should have greater impact on such decisions.

While a number of vice presidents and vice chancellors reminded the authors of the very real factor of "political pressures" in formulating program reduction decisions, it should be noted that in a utopia, such pressures would be nonexistent.

Concluding Thoughts

The survey and its findings raise some interesting thoughts and questions. For example, how does the practical application of program reduction criteria operate? Does an academic program have to rank high in each criterion, or in a majority? Could a program rank low in centrality, which was judged to be at the top of the list by the respondents and high in other selective areas, and be worth keeping? One vice chancellor stated that weakness in one area cannot eliminate an existing program, but deficiency in a single criterion has the potential to keep a proposed new program from being established. Another respondent suggested that "the sum total (of the criteria) is more important than the weighting of individual parts." It must also be kept in mind that the weighting of criteria most probably will differ depending on the program being evaluated. Quoting a systems officer, there are "trade-offs in utilizing the criteria; it is not absolute."

Other questions included: Which deficient criteria could good leadership overcome? Which criteria can be measured quantitatively? Indicators of demand might

include student credit hour production and financial support from external agencies. The cost per student credit hour and the external research dollars generated per faculty member may help measure cost analysis. Critical mass may be determined by such factors as the number of faculty and the amount of space available. Even complementariness can be quantitatively measured in part by determining the number of the program courses listed as degree requirements in other areas. Does this more objective quantitative factor play a greater role in decision making?

Centrality finished at or near the top of each list verifying that it is critical to any program reduction review. Many institutional mission statements, however, are broad enough to cover, albeit loosely, most any academic program. How does this affect this use of centrality as a key criterion in program reduction?

It should be remembered that response to this survey was subjective in part. The questionnaire measured the opinions of 86 academic administrators -- their personal perceptions of what criteria are applied in making program reduction decisions and what criteria should be applied. In any program evaluation process, a number of additional people would be involved at varying levels of the institution/system; thus the university or state board response would reflect more than the perceptions of one person. Nevertheless, much useful information emerges from a synthesis/comparison of perceptions regarding program review criteria on the part of university and system chief academic officers.

As David G. Brown noted,

> As higher education turns to legislators and private donors for more dollars, it must come with its house in order, with the assurance that dollars previously allocated met highest priority needs and that administrative timidity did not permit continued funding of unneeded or inefficient programs. Repeatedly, administrators must apply pruning criteria and, by all means available, implement the decisions to cut programs. Then, and only then, will the dollars flow to higher education at the needed level.[6]

ENDNOTES

[1]William A. Simpson, "Easing the Pain of Program Review: Departments Take the Initiative," Educational Record, Vol. 66, No. 2, Spring, 1985, p. 40.

[2]Kenneth C. Green, "Program Review and the State Responsibility for Higher Education," Journal of Higher Education, 1981, Vol. 52, No. 1, p. 67.

[3]As cited in Gerlinda S. Melchiori, Planning for Program Discontinuance: From Default to Design, AAHE/ERIC, Higher Education Research Report, No. 5, 1982.

[4]David G. Brown, "Criteria for Pruning Programs," Educational Record, Fall 1970, p. 405.

[5]Brown, op. cit., p. 405.

[6]Ibid., p. 409.

The Questionnaire

PART I: STATE SYSTEM'S USE OF PROGRAM REDUCTION CRITERIA*

Please complete Part I of the questionnaire by rating the listed criteria according to the practice of your state system regarding program reduction or elimination.

1. Centrality of the Program to the Institution's Mission

1	2	3	4	5	6	7
Unimportant			Important			Essential

Brown notes that "each program, old and new, must be judged on its contribution to the objectives of the university . . . The pruning process shifts resources from lower to higher priority needs. Each institution has its own speciality . . . . universities should recognize those areas for which they are not well suited, avoid them where possible, and discontinue programs in those areas when mistakes have been made."

2. Critical Mass

1	2	3	4	5	6	7
Unimportant			Important			Essential

The number of students, number of degrees granted, the adequacy of resources including faculty and physical must constitute a "critical mass" for a program to be viable.

3. Complementariness

1	2	3	4	5	6	7
Unimportant			Important			Essential

Some programs may exist because they service other high priority programs, or as Brown notes, "because it strengthens other activities."

* This summary is based on David G. Brown's "Criteria for Pruning Programs" as published in The Educational Record during Fall 1970. The original criteria have been modified and expanded.

4. **Substitutability or Di cation**

1	2	3	4	5	6	7
Unimportant			**Important**			**Essential**

Brown proposes these questions, "Can this (program) be accomplished equally well through another program already funded?, and, What would be substituted if this program were discontinued?" Another question administrators should ponder is "What if two identical or similar courses each have full enrollment?"

5. **Cost Benefit Analysis**

1	2	3	4	5	6	7
Unimportant			**Important**			**Essential**

The resources used for a program determine, in part, the quality of the educational experiences offered and program outcome. According to Brown, "virtually all activities provide benefits, the crucial issue is the relation between benefit and cost."

6. **Vitality of Program**

1	2	3	4	5	6	7
Unimportant			**Important**			**Essential**

Vitality of the program refers to the activities and arrangements for insuring its continuing effectiveness and efficiency. To maintain its vitality and relevance, a program must plan for the continuous evaluation of its goals, clientele served, educational experiences offered, educational methods employed and the use of its resources.

7. **Quality**

1	2	3	4	5	6	7
Unimportant			**Important**			**Essential**

Quality indicators may vary by institutional mission. However, institutions should measure the efforts and quality of their programs by: faculty quality, ability of students, achievements of graduates of the program, curriculum, library, and other critical services.

8. **Demand**

1	2	3	4	5	6	7
Unimportant			Important			Essential

An assessment of the demand for a program takes into account the aspirations and expectations of students, faculty, administration, and the various publics served by the program. Demand reflects the desire of people for what the program has to offer and the needs of individuals and society to be served by the program.

9. **Uniqueness**

1	2	3	4	5	6	7
Unimportant			Important			Essential

A program can be judged unique because of the subject matter treated, the students served, the educational methods employed, and the effect of the achievements of the program on other institutions or agencies. Such programs may be maintained at an institution even though high costs and/or low enrollments are experienced.

10. **Please elaborate on any of your responses:**

_____

_____

_____

_____

11. **Recognizing the great number of criteria which may be used to evaluate programs for possible reduction or elimination, what other criteria have your system used and how important are they to the decision-making process?**

_____

_____

_____

_____

PART II: OPTIMUM OR IDEAL USE OF CRITERIA*

Please complete Part II of the questionnaire rating the listed criteria according to your perception of their optimum (or ideal) use for program reduction or elimination.

1. Centrality of the Program to the Institution's Mission

1	2	3	4	5	6	7
Unimportant			Important			Essential

Brown notes that "each program, old and new, must be judged on its contribution to the objectives of the university . . . . The pruning process shifts resources from lower to higher priority needs. Each institution has its own speciality . . . . universities should recognize those areas for which they are not well suited, avoid them where possible, and discontinue programs in those areas when mistakes have been made."

2. Critical Mass

1	2	3	4	5	6	7
Unimportant			Important			Essential

The number of students, number of degrees granted, the adequacy of resources including faculty and physical must constitute a "critical mass" for a program to be viable.

3. Complementariness

1	2	3	4	5	6	7
Unimportant			Important			Essential

Some programs may exist because they service other high priority programs, or as Brown notes, "because it strengthens other activities."

* This Summary is based on David G. Brown's "Criteria for Pruning Programs" as published in the The Educational Record during Fall 1970. The original criteria have been modified and expanded.

4. Substitutability or Duplication

1	2	3	4	5	6	7
Unimportant			Important			Essential

Brown proposes these questions, "Can this (program) be accomplished equally well through another program already funded?, and, What would be substituted if this program were discontinued?" Another question administrators should ponder is "What if two identical or similar courses each have full enrollment?"

5. Cost Benefit Analysis

1	2	3	4	5	6	7
Unimportant			Important			Essential

The resources used for a program determine, in part, the qualtiy of the educational experiences offered and program outcome. According to Brown, "virtually all activities provide benefits, the crucial issue is the relation between benefit and cost."

6. Vitality of Program

1	2	3	4	5	6	7
Unimportant			Important			Essential

Vitality of the program refers to the activities and arrangements for insuring its continuing effectiveness and efficiency. To maintain its vitality and relevance, a program must plan for the continuous evaluation of its goals, clientele served, educational experiences offered, educational methods employed and the use of its resources.

7. Quality

1	2	3	4	5		7
Unimportant			Important			Essential

Quality indicators may vary by institutional mission, however, institutions should measure the efforts and quality of their programs by: faculty quality, ability of students, achievements of graduates of the program, curriculum, library, and other critical services.

8. **Demand**

1	2	3	4	5	6	7
Unimportant			Important			Essential

An assessment of the demand for a program takes into account the aspirations and expectations of students, faculty, administration, and the various publics served by the program. Demand reflects the desire of people for what the program has to offer and the needs of individuals and society to be served by the program.

9. **Uniqueness**

1	2	3	4	5	6	7
Unimportant			Important			Essential

A program can be judged unique because of the subject matter treated, the students served, the educational methods employed, and the effect of the achievements of the program on other institutions or agencies. Such programs may be maintained at an institution even though high costs and/or low enrollments are experienced.

10. **Please elaborate on any of your responses:**

_____

_____

_____

_____

11. **Recognizing the great number of criteria which may be used to evaluate programs for possible reduction or elimination, what other criteria do you philosophically embrace and how important should they be to the decision-making process?**

_____

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Tables

TABLE: A

UNIVERSITIES: COMPARISON OF ACTUAL AND IDEAL

	Actual	Weighted Rating*	Average Rating	Ideal	Weighted Rating	Average Rating
1.	Centrality	269	6.3 (+.3)**	Centrality	295	6.6
2.	Quality	252	5.9 (+.5)	Quality	290	6.4
3.	Demand	228	5.3	Vitality	253	5.6
4.	Critical Mass	210	4.9 (+.3) (+.7)	Critical Mass	233	5.2
	Vitality	210	4.9 (-.5)			
5.				Substitutability	228	5.1
6.	Complementariness	206	4.8 (+.2)	Complementariness	227	5.0
7.	Cost Analysis	205	4.8 (+.4)	Uniqueness	218	4.8
8.	Substitutability	204	4.7	Demand	216	4.8
9.	Uniqueness	193	4.5 (+.3) (-.2)	Cost Analysis	206	4.6

*Weighted Rating is sum of the ratings received on the questionnaires. Each response was weighted on scale of 1 to 7; 1 being unimportant and 7 being essential.

**Change average rating actual to ideal.

TABLE: B

STATE SYSTEMS: COMPARISON OF ACTUAL AND IDEAL

	Actual	Weighted Rating*	Average Rating	Ideal	Weighted Rating	Average Rating
1.	Centrality	144	5.5 (+.6)**	Quality	166	6.1
	Demand	144	5.5 (+1.3)			
2.				Centrality	164	6.1
3.	Critical Mass	131	5.0 (+.7)	Critical Mass	153	5.7
4.	Quality	125	4.8 (+1.0)	Vitality	152	5.6
5.	Vitality	120	4.6 (+1.0)	Substitutability	147	5.4
6.	Cost Analysis	119	4.6 (+.2)	Demand	141	5.2
7.	Substitutability	115	4.4	Cost Analysis	130	4.8
8.	Complementariness	113	4.3 (+.3)	Complementariness	125	4.6
9.	Uniqueness	106	4.0 (+.4)	Uniqueness	119	4.4

*Weighted Rating is sum of the ratings received on the questionnaires. Each response was weighted on scale of 1 to 7; 1 being unimportant and 7 being essential.

**Change average rating actual to ideal.

TABLE: C

COMPARISON OF UNIVERSITIES AND STATE SYSTEMS' RANKINGS AND AVERAGE RATINGS

Part I: Actual

	Universities	Average Rating	State Sytems	Average Rating
1.	Centrality	6.3 (-.8)*	Centrality	5.5
			Demand	5.5
2.	Quality	5.9 (+.2)		
3.	Demand	5.3 (-1.1)	Critical Mass	5.0
4.	Critical Mass	4.9 (+.1)	Quality	4.8
	Vitality	4.9 (-.3)		
5.			Vitality	4.6
6.	Complementariness	4.8 (-.5) (-.2)	Cost Analysis	4.6
7.	Cost Analysis	4.8	Substitutability	4.4
8.	Substitutability	4.7 (-.3)	Complementariness	4.3
	Uniqueness	4.5 (-.5)	Uniqueness	4.0

Part II: Ideal

	Universities	Average Rating	State Systems	Average Rating
1.	Centrality	6.6 (-.5) (-.3)	Quality	6.1
2.	Quality	6.4	Centrality	6.1
3.	Vitality	5.6 (0) (+.5)	Critical Mass	5.7
4.	Critical Mass	5.2	Vitality	5.6
5.	Substitutability	5.1 (+.3)	Substitutability	5.4
6.	Complementariness	5.0 (-.4)	Demand	5.2
7.	Uniqueness	4.8 (+.4)	Cost Analysis	4.8
8.	Demand	4.8	Complementariness	4.6
9.	Cost Analysis	4.6 (+.2)	Uniqueness	4.4

*Change average rating universities to state systems.

The Institutions

ALABAMA
Auburn University
University of Alabama, Tuscaloosa

ALASKA
University of Alaska, Fairbanks

ARIZONA
Arizona State University
University of Arizona

ARKANSAS
University of Arkansas

CALIFORNIA
University of California-Davis
University of California-Berkeley

COLORADO
Colorado State University
University of Colorado at Boulder

CONNECTICUT
University of Connecticut

DELAWARE
University of Delaware

FLORIDA
Florida State University
University of Florida

GEORGIA
University of Georgia
Georgia Institute of Technology

HAWAII
University of Hawaii

IDAHO
Idaho State University
University of Idaho

ILLINOIS
University of Illinois Urbana-Champaign
Southern Illinois University at Carbondale

INDIANA
Indiana University Bloomington
Purdue University

IOWA
Iowa State University
University of Iowa

KANSAS
Kansas State University
University of Kansas

KENTUCKY
University of Kentucky

LOUISIANA
Louisiana State University

MAINE
University of Maine at Orono

MARYLAND
University of Maryland College Park Campus

MASSACHUSETTS
University of Massachusetts-Amherst

MICHIGAN
Michigan State University
University of Michigan-Ann Arbor

MINNESOTA
University of Minnesota-Minneapolis Saint Paul

MISSISSIPPI
Mississippi State University
University of Mississippi

MISSOURI
University of Missouri-Columbia

MONTANA
Montana State University
University of Montana

NEBRASKA
University of Nebraska-Lincoln

NEW HAMPSHIRE
University of New Hampshire
Rutgers The State University of New Jersey-New Brunswick Campus

NEW MEXICO
New Mexico State University
University of New Mexico

NEW YORK
State University New York-Buffalo
Cornell University

NORTH CAROLINA
North Carolina State University at Raleigh
University of North Carolina at Chapel Hill

NORTH DAKOTA
North Dakota State University
University of North Dakota

OHIO
Ohio State University

OKLAHOMA
University of Oklahoma
Oklahoma State University

OREGON
Oregon State University
University of Oregon

PENNSYLVANIA
Pennsylvania State University

RHODE ISLAND
University of Rhode Island

SOUTH CAROLINA
Clemson University
University of South Carolina at Columbia

SOUTH DAKOTA
South Dakota State University
University of South Dakota

TENNESSEE
University of Tennessee, Knoxville

TEXAS
Texas A & M University
University of Texas at Austin

UTAH
University of Utah
Utah State University

VERMONT
University of Vermont

VIRGINIA
Virginia Polytechnic Institute & State University
University of Virginia

WASHINGTON
University of Washington
Washington State University

WEST VIRGINIA
West Virginia University

WISCONSIN
University of Wisconsin-Madison

WYOMING
University of Wyoming