

Using Cluster Analysis in Peer Selection for a Metropolitan Research University

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Overview

- Motivation for identifying peers
- UCF Mission and Vision
- What is a Metropolitan Research University?
- Overview of cluster analysis
- Approach
 - Institutions to be considered
 - Selection Variables
 - Methods
- Results

The University of Central Florida

- Established in 1963 in Orlando, Florida: Metropolitan Research University
- Grown from 2,600 to 39,000 students in 39 years
 - 32,500 undergraduates and 6,500 graduates
- Doctoral intensive
 - 76 Bachelors, 57 Masters, 3 Specialist, and 19 PhD programs
- Second largest undergraduate enrollment in state
- Approximately 900+ faculty and 3500 staff
- Six colleges and two schools
 - Arts and Sciences, Business Administration, Education, Engineering and Computer Science, Health and Public Affairs, Honors, Optics, and Hospitality Management

Why Did We Look at this Issue?

- Strategic planning discussions (SPC and focus groups)
 - Revised UCF Mission
 - Clearly established UCF VISION
- Led to the basic questions:
 - What is a Metropolitan Research University?
 - How will we know when UCF is the **Leading** Metropolitan Research University?

UCF Mission

- The University of Central Florida is a public multi-campus **metropolitan research university**, dedicated to serving its surrounding communities with their diverse and expanding populations, technological corridors, and international partners.
- The mission of the university is to
 - offer high quality undergraduate and graduate education, student development, and continuing education;
 - **conduct research and creative activities**; and
 - provide services that enhance the intellectual, cultural, environmental, and economic development of the metropolitan region, address national and international issues in key areas, establish UCF as a major presence, and contribute to the global community.

UCF Vision

- The University of Central Florida will be the nation's ***leading metropolitan research university*** recognized for its intellectual, cultural, technological, and professional contributions and renowned for its outstanding programs and partnerships

How Do We Know If UCF Is Leading?

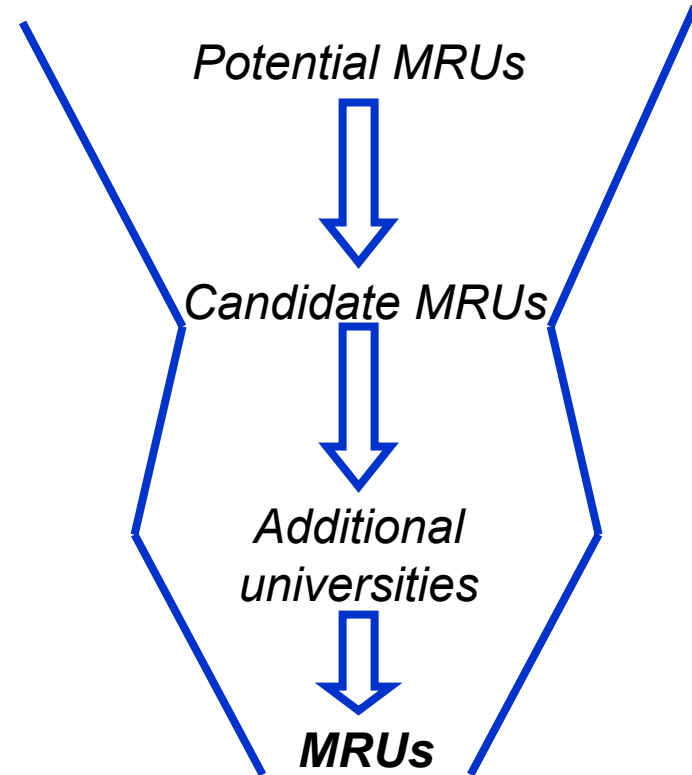
- To which universities do we compare UCF?
 - Metropolitan dimension
 - Research dimension
- What measures do we use?
 - Mission related
 - Performance focus

General Approach

- Focus on identifying potential MRU “comparable peers”
 - Metropolitan and research focus
 - Similar characteristics to UCF
- Identify data feasibility and sources
- Identify related efforts
 - Coalition of Urban and Metropolitan Universities (CUMU)
 - Portraits of Universities with Metropolitan Alliances (PUMA)
- Initial data collection
 - Sort, organize, and assess consistency and availability
- Quantitative analysis—cluster analysis
- Evaluation

Phased Structure

- Initial Identification
 - Qualitative identification of potential metropolitan research universities
- Aggregation and screening
 - Quantitative evaluation of potential MRU to define class of institutions comprising MRU
- Refinement
 - Classify set of MRU institutions as similar peers, near-peers, and other peers.



Existing Peer Institutions

- George Mason University
- Georgia State University
- San Diego State University
- State University of New York, Albany
- University of Delaware
- University of Houston System
- University of Louisville
- University of Wisconsin--Milwaukee
- Wayne State University
- Western Michigan University

CUMU Universities

- Boise State U
- Brooklyn College –
- The City U of New York
- California State U - Fresno
- **California State U - Hayward**
- **California State U - Sacramento**
- California State U - San Bernardino
- **Cleveland State U**
- **Eastern Michigan U**
- **Florida Atlantic U**
- **Florida International U**
- **Georgia State U**
- Hunter College,
- The City U of New York
- Indiana U Northwest
- **Indiana U - Purdue**
- Kean U
- Kennesaw State U
- Metropolitan State U – Denver
- Northern Kentucky U
- **Oakland U**
- **Pace U**
- **Portland State U**
- Purdue U - Calumet
- **San Jose State U**
- Simon Fraser U - International Affiliate
- **Southern Illinois U - Edwardsville**
- Southwest Missouri State U
- Southwest Texas State U
- Towson U
- U of Alaska at Anchorage
- U of Arkansas at Little Rock
- **U of Central Florida**
- U of Central Oklahoma
- **U of Houston - Downtown**
- **U of Houston System**
- **U of Illinois at Chicago**
- **U of Louisville**
- **U of Maryland College Park**
- U of Maryland System
- **U of Massachusetts at Boston**
- **U of Missouri - Kansas City**
- **U of Missouri - St. Louis**
- **U of Nebraska at Omaha**
- **U of Nevada - Las Vegas**
- **U of North Carolina at Charlotte**
- **U of North Carolina at Greensboro**
- **U of North Florida**
- **U of North Texas**
- **U of South Carolina - Spartanburg**
- **U of South Florida**
- U of Tennessee at Chattanooga
- **U of Texas at San Antonio**
- U of Western Sydney-Nepean - International Affiliate
- **Virginia Commonwealth U**
- Washburn U
- **Washington State U- Spokane**
- **Washington State U- Vancouver**
- **Wright State U**
- York U - International Affiliate

PUMA Universities

Urban 13/21	
Cleveland State University	<u>University of Memphis</u>
Georgia State University	University of Missouri, Kansas City*
Indiana University Purdue University Indianapolis*	University of Missouri, St. Louis*
Portland State University	<u>University of New Orleans</u>
Temple University	<u>University of Toledo</u>
University of Alabama, Birmingham	University of Wisconsin, Milwaukee
University of Cincinnati	Virginia Commonwealth University
University of Houston*	Wayne State University
University of Illinois, Chicago	
University of Massachusetts, Boston	California State University Sacramento*†

*Also a member of the Coalition for Urban and Metropolitan Universities

†Not actually in the Urban 13, but participated through affiliated work on Urban University Portfolio Project.

CUMU	
<u>Boise State University</u>	<u>Towson University</u>
Brooklyn College, CUNY	<u>University of Alaska at Anchorage</u>
<u>California State University Fresno</u>	University of Central Florida
Eastern Michigan University	<u>University of Colorado, Colorado Springs</u>
<u>Hunter College, CUNY</u>	University of Houston, Downtown
<u>Kennesaw State University</u>	University of Nebraska at Omaha
<u>Northern Kentucky University</u>	University of North Texas
Oakland University	<u>University of Tennessee at Chattanooga</u>
San Diego State University	University of Texas at San Antonio
Southern Illinois Univ. at Edwardsville	Washburn University
<u>Southwest Missouri State University</u>	Wichita State University

Institutions Considered for Analysis

- Existing “Peer” Institutions
- SUS Institutions
- Collegiate Results Instrument Peer Institutions (Knight Collaborative)
- Selected US News & World Report Lower 3rd Tier Institutions (Provost)
- Selected US News & World Report Upper 4th Tier Institutions (Provost)
- Other Institutions—selected from member universities of the Coalition of Urban & Metropolitan Universities
- 66 in screening phase plus 8 in refinement phase

MRU Characteristics

- Metropolitan area characteristics
- Student characteristics
- Program structure characteristics
- Research characteristics
- Financial characteristics

Primary Data Sources

- Population characteristics
 - <http://site.conway.com/ez/>
- Student characteristics
 - <http://nces.ed.gov/ipeds/>
 - <http://www.usnews.com/usnews/edu/college/coworks.htm>
 - Individual university websites
- Faculty characteristics
 - <http://nces.ed.gov/ipeds/>
- Research characteristics
 - <http://www.nsf.gov>
 - Web of Science
- Financial characteristics
 - <http://nces.ed.gov/ipeds/>

Variable Selection

- Data initially collected for 80 variables
- Initial analyses conducted with 43 variables
- Evaluations with various variables removed resulted in 28 variables for screening analysis phase
- Decision review resulted in modifying the variable list— 21 final variables for refinement phase
- Further reduction to 12 variables by eliminating school size and metropolitan area characteristics

Note: [Data for all variables and institutions are located at <http://uaps.ucf.edu/Benchmarking.html>]

Screening Phase Variables

- P-Actual population 1999
- P-% Urban population
- P-% White population
- P-% 18-24 years old
- P-% College or graduate degree
- P-% White collar occupation
- S-Ratio of UG to GR headcount
- S-Ratio of full-time to part-time headcount
- S-Total headcount
- S-% headcount White
- S-Ratio UG headcount to degrees awarded
- S-Ratio of GR headcount to graduate and doctoral degrees awarded
- S-Doctoral degrees awarded
- S-Doctoral programs offered
- S-Medical school
- S-Acceptance rate
- S-High school GPA
- F-Full-time faculty
- F-Part-time faculty
- F-Tenured faculty
- \$-Ratio of expenditures per student
- \$-Endowment
- \$-R & D funding

Refinement Phase Variables

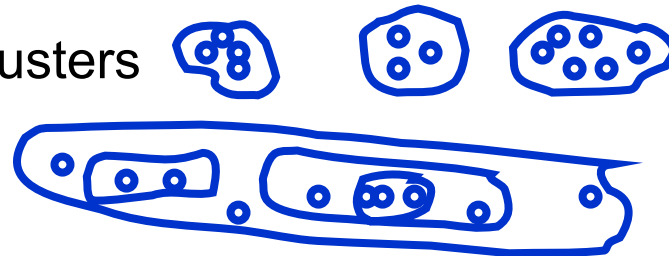
- *P-Actual population 1999*
- *P-% Urban population*
- *P-% White population*
- *P-% 18-24 years old*
- *P-% College or graduate degree*
- *P-% White collar occupation*
- **S-Ratio of UG to GR headcount**
- **S-Ratio of full-time to part-time headcount**
- *S-Total headcount*
- *S-% headcount White*
- **S-Ratio UG degrees awarded to UG headcount**
- **S-Ratio of graduate and doctoral degrees awarded to GR headcount**
- **S-Bachelor Programs awarded degrees**
- **S-Masters Programs awarded degrees**
- **S-Doctoral Programs awarded degrees**
- **S-Medical school**
- **F-Full-time faculty**
- **\$-Ratio of expenditures per student**
- **\$-Endowment**
- **R-R & D funding**
- **R-Publications per full-time faculty**

Note: Final variables in boldface

Methodology—Cluster Analysis

- Multivariate statistical procedure used to partition a set of objects into relatively homogeneous subsets based on inter-object similarities
- Classify universities into groups with minimal differences between the universities in a cluster and maximum differences between the clusters
- Approaches

- Mutually exclusive clusters
- Hierarchical clusters



Mutually Exclusive Cluster Approach

- Used in both screening and refinement phases
- SPSS K-Means Clustering
 - Allows for missing data
 - Good at handling larger data sets
 - Analyst specifies number of clusters
 - Multiple analyses were conducted using different number of clusters
 - Wanted final member cluster size not to exceed 25
 - Reviewed results using different number of clusters
 - Selecting Variables
 - Number of variables included in analysis had to be reduced from the original 80 variables collected (number of variables must be less than the number of institutions analyzed).

Sample Output-Cluster Membership

Cluster Membership				
Case Number	VARIABLE	Variable Label	Cluster	Distance
1		Old Dominion Univ.	1	2.228
2		Univ. of Nevada at Las Vegas	1	2.242
3		Univ. of South Florida	2	2.446
4		Georgia State Univ.	1	2.351
5		Univ. of Wisconsin, Milwaukee	1	2.113
6		Univ. of Cincinnati-Main Campus	4	2.361
7		San Diego State Univ.	1	1.968
8		State Univ. of New York, Albany	1	3.366
9		Univ. of Alabama at Birmingham	2	4.549
10		Univ. of Louisville	2	2.136
11		Florida Atlantic Univ.	1	1.997
12		Florida International Univ.	1	1.363
13		Cleveland State Univ.	1	2.493
14		Portland State Univ.	1	1.628
15		Univ. of Missouri at St.Louis	1	3.162
16		Univ. of Texas- Arlington	1	1.743
17		Univ. of Central Florida	1	1.884
18		George Mason Univ.	1	2.437
19		Indiana Univ. - Purdue Univ. at Indianapolis	2	2.948
20		Kent State Univ.	1	2.397
21		North Carolina State Univ.	4	2.046
22		Univ. of Delaware	3	.000
23		Univ. of North Carolina at Charlotte	1	1.764
24		Univ. of North Texas	1	2.736
25		Virginia Commonwealth Univ.	2	1.821
26		Wayne State Univ.	4	2.579
27		Western Michigan Univ.	1	3.605
28		Wright St. Univ.	1	2.709

Sample Output-Cluster Centers

Distances between Final Cluster Centers

Cluster	1	2	3	4	5
1		5.344	6.739	6.678	2.423
2	5.344		6.951	6.677	4.861
3	6.739	6.951		8.286	7.532
4	6.678	6.677	8.286		6.134
5	2.423	4.861	7.532	6.134	

Sample Output-ANOVA

ANOVA

	Cluster		Error		F	Sig.
	Mean Square	df	Mean Square	df		
ZUGTOGRH Zscore: Ratio of UG to GR headcount	1.757	3	.905	24	1.941	.150
ZFTTOPTTE Zscore: Ratio of full time to part time	6.709	3	.286	24	23.429	.000
ZUGDTOUG Zscore: Ratio of UG degrees awarded to	3.142	3	.732	24	4.290	.015
ZGRDTOGR Zscore: Ratio of GR degrees awarded to	1.111	3	.986	24	1.127	.358
ZUGPROAW Zscore: Bachelors Programs Awarded degr	1.355	3	.956	24	1.418	.262
ZGRPROAW Zscore: Masters Programs Awarded degree	4.281	3	.590	24	7.258	.001
ZDOPROAW Zscore: Doctoral Programs Awarded degree	4.441	3	.570	24	7.793	.001
ZFTFACUL Zscore: Full time faculty	7.804	3	.150	24	52.182	.000
ZEXP_STU Zscore: Expenditure per student	3.594	3	.676	24	5.318	.006
ZRD_FUND Zscore: Total R & D funds	6.735	3	.283	24	23.794	.000
ZENDOWME Zscore: Ending market value of endowmen	6.063	3	.367	24	16.516	.000
ZPUB_FTF Zscore: Publications per Full Time Facu	4.757	3	.530	24	8.970	.000

The F tests should be used only for descriptive purposes because the clusters have been chosen to maximize the differences among cases in different clusters. The observed significance levels are not corrected for this and thus cannot be interpreted as tests of the hypothesis that the cluster means are equal.

Hierarchical Clustering Approach

- Used only in refinement phase
- SPSS Hierarchical Clustering
 - Finds “closest” pair of objects and combines to form a cluster and repeats. Cluster formed in later stage includes previous clusters
 - Eliminates institutions with any missing data
 - Standardizes variables
 - Analyst specifies distance measure
 - Squared Euclidean distance frequently used
 - Analyst specifies linking method
 - Between-groups, Wards’s method, nearest neighbor, furthest neighbor
 - Use multiple methods

Sample Output-Proximity Matrix

Proximity Matrix

Case	Squared Euclidean Distance						
	1:Univ. of Central Flo	2:Florida Atlantic Uni	3:Florida Internationa	4:Univ. of South Flori	5:Cleveland State Univ	6:George Mason	7:Georgia State Univ.
1:Univ. of Central Flo		.158	.229	1.141	1.182	.968	1.072
2:Florida Atlantic Uni	.158		.335	1.397	.798	.821	1.109
3:Florida Internationa	.229	.335		.971	.878	.869	.576
4:Univ. of South Flori	1.141	1.397	.971		1.910	1.458	1.039
5:Cleveland State Univ	1.182	.798	.878	1.910		.407	.925
6:George Mason Univ.	.968	.821	.869	1.458	.407		.555
7:Georgia State Univ.	1.072	1.109	.576	1.039	.925	.555	
8:Indiana Univ. - Purd	1.867	1.693	1.627	1.246	1.640	2.271	2.116
9:Kent State Univ.	.654	.931	.375	1.380	1.349	1.183	.490
10:North Carolina State	2.930	3.418	2.625	1.275	3.996	3.532	2.140
11:Old Dominion Univ.	1.015	.700	.852	1.570	.137	.213	.701
12:Portland State Univ.	.798	.575	.499	1.354	.189	.406	.569
13:San Diego State Univ	.125	.346	.289	.955	1.133	.689	.844
14:State Univ. of New Y	1.294	1.418	1.182	1.732	1.382	.725	.619
15:Univ. of Alabama at	2.760	3.005	2.561	1.782	2.933	2.283	2.127
16:Univ. of Cincinnati-	3.393	3.759	2.861	1.359	4.124	3.883	2.426
17:Univ. of Delaware	2.015	2.698	2.440	2.777	4.113	3.403	2.994
18:Univ. of Louisville	1.370	1.226	.889	.784	.763	1.033	.794
19:Univ. of Missouri at	.778	.381	.742	2.392	.698	1.288	1.671
20:Univ. of Nevada at L	.554	.399	.464	1.417	.523	1.030	1.143
21:Univ. of North Carol	.205	.175	.226	1.586	.832	1.028	1.128
22:Univ. of North Texas	.989	1.157	.561	1.163	1.417	1.406	.483
23:Univ. of Texas- Arli	.587	.440	.557	1.266	.585	.444	.457
24:Univ. of Wisconsin,	.535	.574	.272	1.593	.743	.940	.805
25:Virginia Commonwealt	1.314	1.298	.862	.482	.947	.853	.612
26:Wayne State Univ.	2.932	3.335	1.966	1.264	2.849	2.428	1.121
27:Western Michigan Uni	.741	1.154	.611	1.424	1.511	1.466	1.080
28:Wright St. Univ.	.829	1.082	.403	1.547	1.136	.993	.724

This is a dissimilarity matrix

Sample Output-Agglomeration Schedule

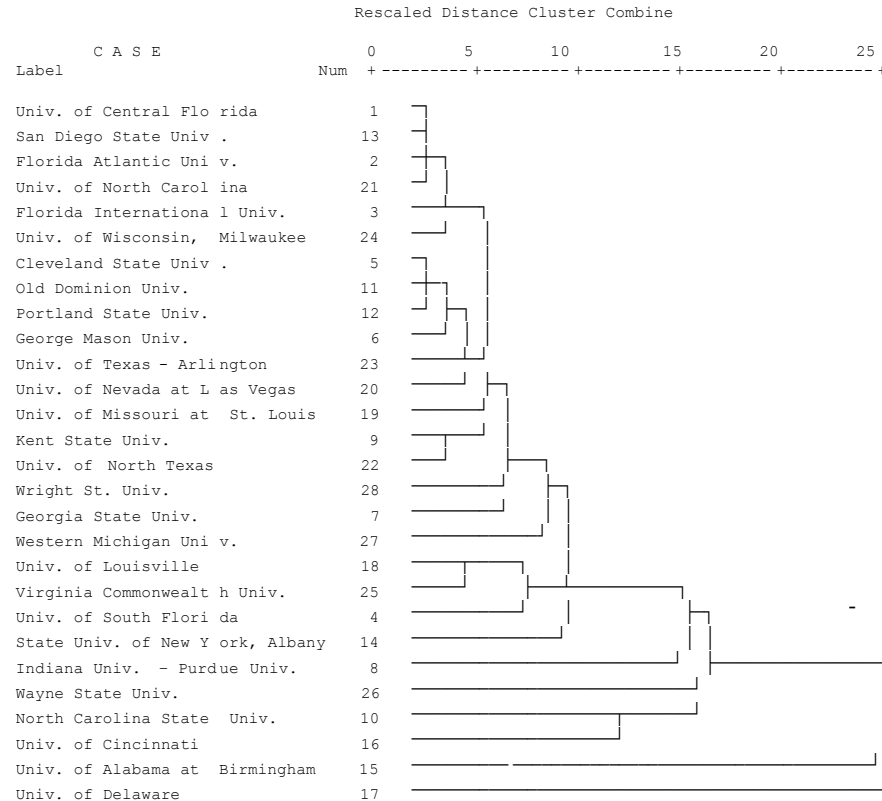
Agglomeration Schedule

Stage	Cluster Combined		Coefficients	Stage Cluster First Appears		Next Stage
	Cluster 1	Cluster 2		Cluster 1	Cluster 2	
1	1	13	.125	0	0	4
2	5	11	.137	0	0	3
3	5	12	.142	2	0	7
4	1	2	.158	1	0	5
5	1	21	.175	4	0	8
6	9	22	.204	0	0	15
7	5	6	.213	3	0	10
8	1	3	.226	5	0	9
9	1	24	.238	8	0	13
10	5	23	.276	7	0	12
11	18	25	.298	0	0	18
12	5	20	.325	10	0	13
13	1	5	.330	9	12	14
14	1	19	.357	13	0	15
15	1	9	.375	14	6	16
16	1	28	.403	15	0	17
17	1	7	.457	16	0	19
18	4	18	.482	0	11	20
19	1	27	.552	17	0	20
20	1	4	.612	19	18	21
21	1	14	.619	20	0	23
22	10	16	.844	0	0	25
23	1	8	1.055	21	0	24
24	1	26	1.067	23	0	25
25	1	10	1.070	24	22	26
26	1	15	1.674	25	0	27
27	1	17	1.800	26	0	0

Representative Dendrogram

12 Variables -Subset of Variables, Excluding Medical School Indicator

Dendrogram using Single Linkage



Preliminary Screening Analysis

- Removed institutions with a total enrollment of less than 13,207 student headcount
 - Focus on “large” metropolitan research universities
 - Final institution list included 42 of the original 66 institutions
- Reduced the number of variables
- Categorized doctoral, R&D, and medical school variables as “research variables”

Synthesis of Screening Phase

- Ran analyses with research and without research variables
- For both sets of variables, ran analyses removing selected demographic and institution variables individually
- Number of clusters ranged from 4 to 10
- Universities were selected as potential MRU peers if they significantly showed up in the UCF cluster for three of four categories using research variables and cluster size

Moving from Screening to Refinement

- Screening phase identified
 - 16 potential peers
 - 6 almost potential peers
 - 5 current peers not otherwise included
- Review of selection variables
 - Modified variable list to 21 variables
- Review of institutions
 - Threshold criteria (>13,500 students, doctoral programs, research funding)
 - Reduced candidates to 28 institutions

Synthesis of Refinement Phase

- Ran both K-Means and Hierarchical analyses
 - All 21 variables
 - Reduced set of 12 variables (removed 6 population, total headcount, ethnicity, and medical school variables)
- Used both standardized z-scores and 0-1 scale for data
- Number of clusters ranged from 2 to 8 for K-means
- Used multiple linking methods for hierarchical clusters
- Evaluated tabular and graphical results

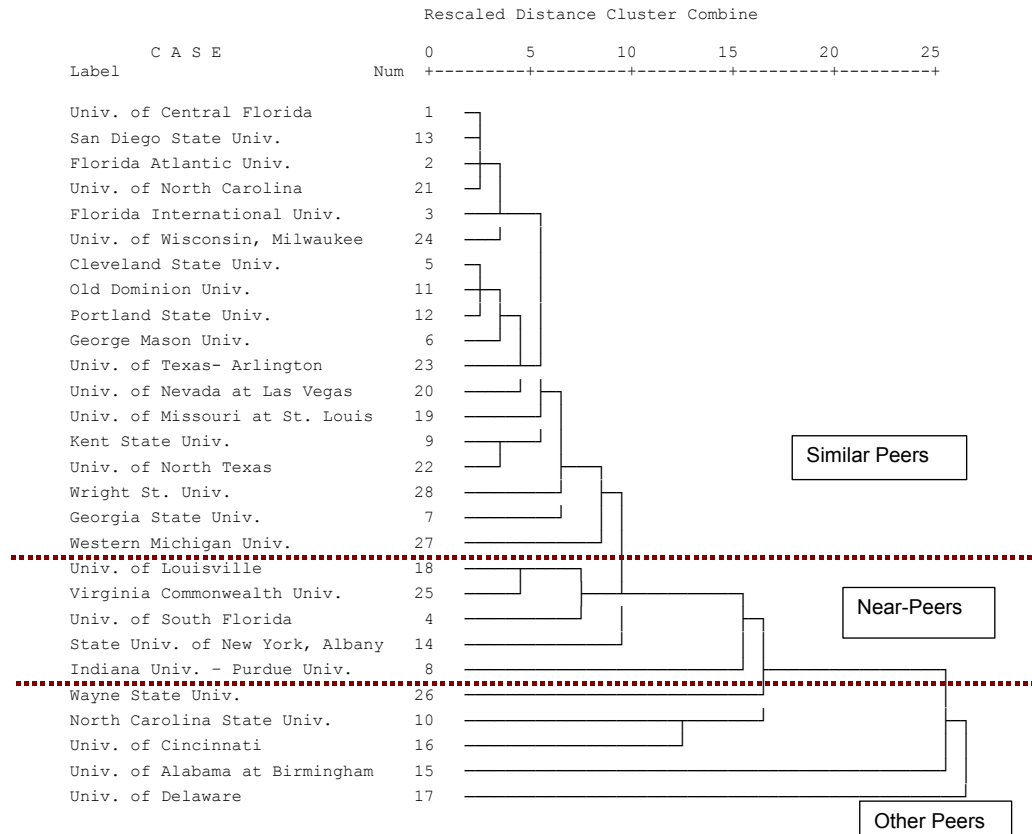
K-means Comparison Table

	28/12/non	28/12/alpha	28/13/alpha	28/13/non	28/21/alpha	28/21/non	Sum
• University of Central Florida							
• University of Wisconsin, Milwaukee	8	7	7	7	7	7	43
• University of Nevada at Las Vegas	7	6	7	7	7	7	41
• Florida International University	8	7	7	7	5	6	40
• University of North Carolina at Charlotte	8	7	7	7	5	6	40
• Florida Atlantic University	7	6	7	7	6	6	39
• Old Dominion University	7	6	6	5	6	6	36
• Portland State University	7	6	6	5	6	6	36
• University of Texas-Arlington	7	6	6	5	6	6	36
• University of Missouri at St. Louis	6	5	6	6	6	6	35
• Cleveland State University	7	5	5	4	6	6	33
• Kent State University	5	5	5	6	5	5	31
• San Diego State University	6	5	5	6	5	3	30
• Western Michigan University	5	5	5	6	4	3	28
• University of North Texas	5	5	5	6	3	3	27
• Wright St. University	5	5	4	4	3	3	24
• George Mason University	4	4	4	4	2	2	20
• State University of New York, Albany	4	3	4	4	3	2	20
• Georgia State University	4	4	4	4	1	2	19
• University of Louisville	2	3	3	2	4	3	17
• Indiana University – Purdue University	2	3	2	2	3	2	14
• Virginia Commonwealth University	2	3	2	2	1	1	11
• University of South Florida	2	2	1	1	2	2	10
• Wayne State University	0	0	1	0	2	1	4
• University of Alabama at Birmingham	1	1	1	0	0	0	3
• University of Delaware	0	0	0	1	1	0	2
• North Carolina State University	1	0	0	0	0	0	1
• University of Cincinnati – Main Campus	0	0	0	0	0	0	0

Representative Dendrogram

12 Variables-Subset of Variables, Excluding Medical School Indicator

Dendrogram using Single Linkage



Results: Similar Peer Universities (18)

- University of Central Florida (C) (P) (M)
- Florida Atlantic University (C)
- Florida International University (C) (M)
- Cleveland State University (C) (P)
- George Mason University (M)
- Georgia State University (C) (P) (M)
- Kent State University
- Old Dominion University
- Portland State University (C) (P) (M)
- San Diego State University (P)
- University of Missouri at St. Louis (C) (P)
- University of Nevada at Las Vegas (C)
- University of North Carolina at Charlotte (C)
- University of North Texas (C) (P)
- University of Texas at Arlington
- University of Wisconsin–Milwaukee (P)
- Western Michigan University
- Wright State University (C)
(current peer) (P)—PUMA (C)—CUMU (M)—MUG

Similar Peers Selected Data (1999)

Variable Label	Actual pop. 1999	Total headcount	Ratio of UG to GR headcount	full time to part time enrollme	UG degrees awarded to UG	GR degrees awarded to GR	Doctoral Programs Awarded degree	Full time faculty	Expenditu re per student	Ending market value of endowment assets	Total R & D funds (x1000)	Publication s per Full Time Faculty
Univ. of Central Florida	1,523,947	33,713	5.173	1.94	.19	.25	14	877	9199	\$68,009,777	\$42,466	0.47
Florida Atlantic Univ.	1,036,881	21,046	4.928	0.89	.18	.22	11	729	11696	\$108,439,212	\$17,151	0.37
Florida International Univ.	2,064,609	31,945	4.582	1.10	.16	.26	17	863	9745	\$32,822,649	\$25,061	0.55
Cleveland State Univ.	2,221,479	15,294	2.302	1.19	.14	.21	6	544	11976	\$19,735,180	\$11,893	0.41
Georgia State Univ.	3,763,334	23,625	2.498	1.27	.16	.28	38	943	13519	\$65,453,026	\$36,523	0.54
George Mason Univ.	4,717,189	23,408	2.017	1.10	.18	.27	13	881	12544	\$33,501,213	\$26,766	0.51
Kent State Univ.	2,221,479	21,924	4.047	3.15	.17	.27	39	621	13135	\$42,766,000	\$11,083	0.87
Old Dominion Univ.	1,569,852	18,969	2.068	1.08	.17	.20	12	607	10681	\$18,925,594	\$23,030	0.51
Portland State Univ.	1,845,644	18,889	2.588	1.05	.16	.21	10	618	9821	\$2,312,096	\$13,940	0.31
San Diego State Univ.	2,774,951	31,609	4.312	2.34	.20	.27	9	952	15562	\$54,903,891	\$45,579	0.53
Univ. of Missouri at St.Louis	2,577,983	15,397	5.113	0.64	.13	.22	7	502	9541	\$39,319,145	\$10,294	0.14
Univ. of Nevada at Las Vegas	1,370,533	22,041	4.025	1.10	.15	.18	13	689	10829	\$41,964,000	\$20,170	0.14
Univ. of North Carolina at Charlotte	1,390,870	17,241	5.043	1.98	.16	.25	7	643	12002	\$82,760,822	\$9,041	0.16
Univ. of North Texas	4,849,655	27,054	3.513	2.09	.16	.21	44	753	9856	\$46,369,165	\$7,487	0.73
Univ. of Texas- Arlington	1,602,782	20,424	3.105	1.52	.19	.21	30	745	9848	\$35,213,976	\$11,450	0.16
Univ. of Wisconsin, Milwaukee	1,450,765	23,578	4.443	2.15	.13	.29	17	784	12335	\$6,199,666	\$22,207	0.16
Western Michigan Univ.	449,672	28,657	3.856	2.22	.17	.25	29	813	12539	\$116,276,610	\$13,727	0.38
Wright St. Univ.	943,192	13,964	3.528	2.87	.16	.32	5	616	16575	\$5,926,284	\$23,131	0.80

Headcount data, Fall 2000

Results: Near-Peer Universities (5)

- Indiana University – Purdue University (C) (P)
- State University of New York, Albany
- University of Louisville (C) (M)
- University of South Florida (C)
- Virginia Commonwealth University (C) (M)

(current peer) (P)—PUMA (C)—CUMU (M)--MUG

Near-Peers Selected Data (1999)

Variable Label	Actual pop. 1999	Total headcount	Ratio of UG to GR headcount	full time to part time enrollme	UG degrees awarded to UG	GR degrees awarded to GR	Doctoral Programs Awarded degree	Full time faculty	Expenditure per student	Ending market value of endowment assets	Total R & D funds (x1000)	Publications per Full Time Faculty
Univ. of Central Florida	1,523,947	33,713	5.173	1.94	.19	.25	14	877	9199	\$68,009,777	\$42,466	0.47
Univ. of South Florida	2,268,499	35,561	3.513	1.32	.17	.21	21	1,943	16211	\$220,927,976	\$123,961	0.67
Indiana Univ. - Purdue Univ. at Indian	1,533,645	27,525	4.091	1.16	.11	.15	15	1,534	25850	\$24,898,270	\$194,790	0.01
State Univ. of New York, Albany	877,553	16,751	2.370	3.07	.20	.27	35	567	16794	\$9,369,000	\$64,278	1.22
Univ. of Louisville	1,005,120	19,771	2.725	1.83	.12	.12	20	1,248	23908	\$421,303,000	\$57,051	0.77
Virginia Commonwealth Univ.	967,911	24,066	2.678	1.78	.13	.22	23	1,612	20415	\$29,010,982	\$79,785	0.85

Headcount data, Fall 2000

Results: Other MRU Peer Universities (5)

- North Carolina State University
- University of Alabama at Birmingham (P)
- University of Cincinnati – Main Campus (P)
- **University of Delaware**
- **Wayne State University (P) (M)**

(current peer) (P)—PUMA (C)—CUMU (M)--MUG

Other MRU Peers Selected Data (1999)

Variable Label	Actual pop. 1999	Total headcount	Ratio of UG to GR headcount	full time to part time enrollme	UG degrees awarded to UG	GR degrees awarded to GR	Doctoral Programs Awarded degree	Full time faculty	Expenditure per student	Ending market value of endowment assets	Total R & D funds (x1000)	Publications per Full Time Faculty
Univ. of Central Florida	1,523,947	33,713	5.173	1.94	.19	.25	14	877	9199	\$68,009,777	\$42,466	0.47
North Carolina State Univ.	1,105,535	28325	3.471	2.71	.17	.18	59	1500	26786	\$314,291,640	\$270,621	1.29
Univ. of Alabama at Birmingham	913,910	14,951	2.837	2.28	.15	.32	22	1,717	81280	\$273,679,328	\$232,115	0.29
Univ. of Cincinnati-Main Campus	1,960,995	26316	3.192	2.23	.14	.19	52	1809	22755	\$960,326,667	\$153,002	1.15
Univ. of Delaware	566,381	19,072	5.439	8.08	.21	.29	31	933	25118	\$841,842,338	\$73,521	1.32
Wayne State Univ.	4,486,071	30,408	1.890	0.84	.13	.28	45	1,473	19846	\$157,641,971	\$146,832	1.40

Headcount data, Fall 2000

Current Peers that are Not Included

- **University of Houston System (C)**

(current peer) (P)—PUMA (C)—CUMU (M)—MUG

Implementation and Use

- Official review and approval
- Develop relevant performance measures for MRUs
 - Management focus
 - Accountability considerations
 - PUMA dimensions (access and support; student learning in the urban context; diversity and pluralism; civic engagement; urban relevance of programs and scholarship)
- Assess vision—become the leading metropolitan research university
 - Identify “comparison” peers—most similar performance
 - Identify “aspirational” MRU peers—*best-in-class*
- Use for benchmarking and continuous improvement

Questions



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