Peer Group Toolkit

This toolkit exists to provide a step-by-step guide for individuals and groups that need to use a purpose-specific peer group for effective decision-making.

The office of Planning, Analytics & Institutional Research (PAIR) can assist your team in using this Toolkit. As you plan your process, read the following steps and note where PAIR is available for consultation and analysis assistance.

What is a Peer Group?

Peer groups are lists of higher education institutions that are comparable to JMU on some variable or combination of variables. A peer group might consist of all public schools in Virginia (state peers), all schools that compete in the Sun Belt athletic conference (athletic conference peers), or all schools that commonly admit the same students as JMU (cross-admit peers).

A peer group can also be used to benchmark JMU against a group of comparable institutions for a given purpose, like determining how JMU's average faculty salary compares against other R2 institutions. This approach can also be used to determine aspirant schools—institutions that are like JMU in many ways, but that have greater performance on some specific indicator (e.g., endowment size). In this case, JMU can set targets for improvement that lead to better outcomes in a particular way.

As JMU evolves as a higher education institution, stakeholders are often interested in comparing us to other institutions. Because peer groups are often very specific in nature, developed for a particular purpose and based on specific characteristics, JMU encourages stakeholders to develop purpose-specific peer groups. Therefore, JMU does not advocate for the use of a single group of peer institutions, but in a process aimed at developing a set of peers based on a particular reason. The following are common peer groups that are often used by JMU stakeholders.

If you are part of any efforts to benchmark JMU against a set of higher education institutions to help achieve a specific purpose not listed below, please review the Peer Group Development Toolkit for step-by-step instructions on how to create a purpose-specific peer group. The process involves the following steps:

Step 1: What type of peer group are you looking for?
Step 2: Articulate the purpose of your peer group
Step 3: Determine the population of institutions
Step 4: Select a preliminary set of variables for consideration
Step 5: Confirm data are available and reliable for variables selected
Step 6: Analyze relationships between variables
Step 7: Assign weights to the final list of variables
Step 8: Conduct analysis
Step 9: Create final list of peers

Why was the Peer Group Toolkit created?

The university developed the National Peer Group for when an individual or group requires one for any number of general use cases (grants, accreditation reports, etc.). However, ideally, a peer group should be developed for a specific purpose, and the factors or variables used to determine the most comparable institutions depend on that purpose. The Institutional Peers Task Force recommended developing a peer group development toolkit for the broader campus community to use when considering how best to benchmark JMU or specific groups on a specific measure of interest.

Step 1

What type of peer group are you looking for?

First, you need to determine what type of peer group you need. Ask yourself: what is the purpose of the comparison? On what grounds is a comparison to other schools necessary? The answers to these questions help determine the type of analysis needed to form the peer group. For instance, if you want to compare JMU against other institutions that also tend to accept applications from JMU applicants, then you simply need to find data on this one variable: cross-applicants. If you want to compare us against other institutions that rank similarly in U.S. News and World Reports, then all you need to do is to do an internet search for the rankings information and look for schools close to JMU. These types of peer groups are pre-determined based on the specific interest of the study or question being posed. They require no additional analysis.

However, sometimes these pre-determined peer groups are not appropriate for us to use. As an example, we often want to know how JMU compares against other schools concerning faculty salaries. We could use a pre-determined list of institutions, such as other Virginia publics, or R2 institutions, but this may not make sense. Private research institutions, ones in areas with higher cost of living, or highly selective institutions may pay their faculty more and do not provide a comparable environment needed to determine the quality of compensation offered at JMU. Here, more reflection is likely needed to identify institutions that have similar qualities to JMU on variables such as enrollment size, sector (public vs private), and student outcomes.

If the purpose of your peer group is to benchmark JMU against "like institutions" for the purpose of decision making, then this toolkit may provide you with the steps you need to complete such a task.

Step 2

Articulate the purpose of your peer group

If you determine that a pre-existing peer group—like those with the same Carnegie Classification—won't suffice, then the first step is to articulate the purpose of the group you're trying to develop.

Action Item: Provide a response to the following prompt:

We are developing a peer group for the purpose of determining _____.

Some common examples might include:

- Benchmarking JMU against institutions to compare the relative standing of average salaries. If we are in the lower half of the peer group, it might require us to consider ways to increase salaries to become more competitive in hiring and retention efforts.

- Comparing JMU against other institutions in terms of graduation rates. How does JMU compare against institutions with similar characteristics on this important student outcome? If we do well, why is that? If we do poorly, what are the factors?

- Benchmarking a specific college at JMU against similar ones at other institutions to compare the number of tenured faculty in that area. This information might be useful for a dean to make a case to the provost for additional faculty lines.

This step should be completed before all others and should serve to articulate the purpose of establishing the peer group.

Use the flowchart below to help you determine the best way to proceed:
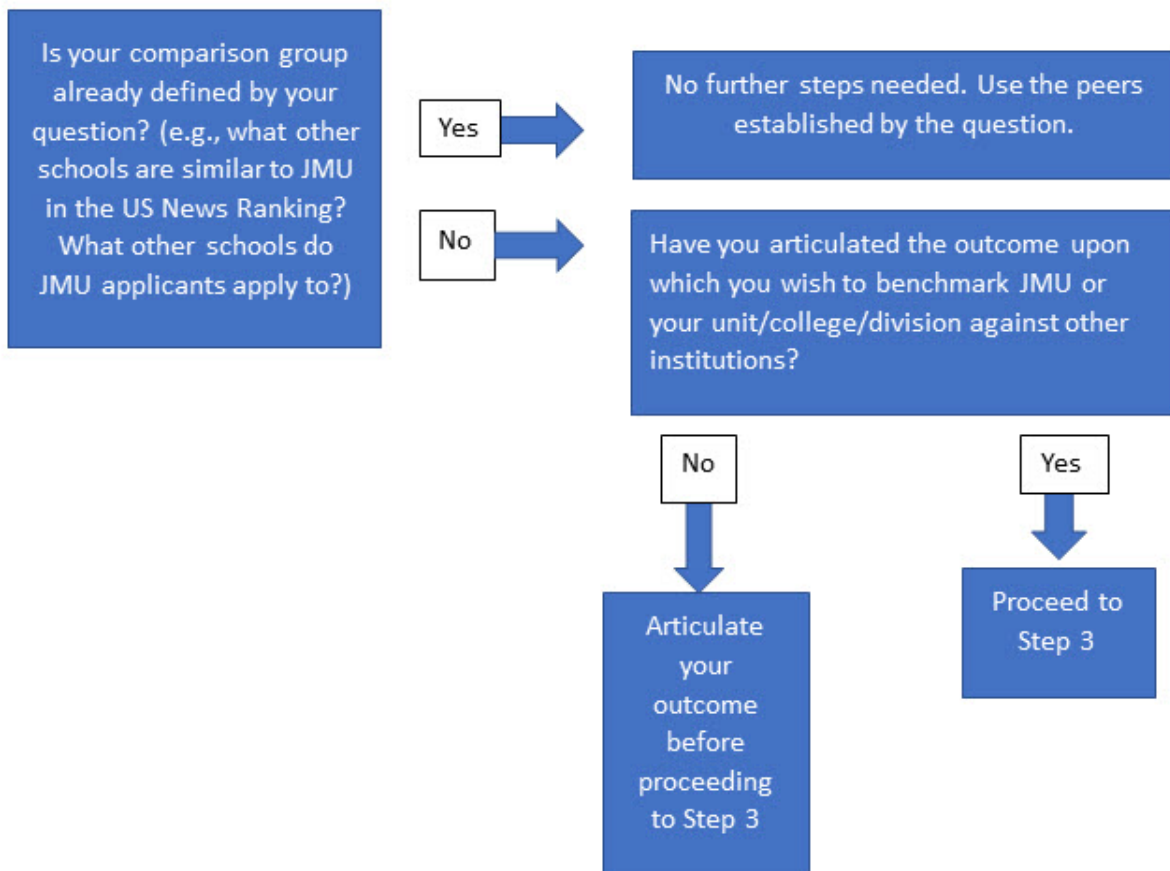
Aspirants vs. Peers

We often want to compare ourselves against aspirant institutions. As the name suggests, these are institutions we aspire to become more like. To determine aspirant institutions, however, we must first determine institutions that we are similar to in some way so that we can then identify the way in which we want to be more like them.

As an example, we may aspire to resemble a set of institutions in terms of research expenditures. To do this, we must first determine the ways in which these aspirant schools are comparable to us. In the example of research expenditures, are there types of institutions that we would not aspire to be like for research? How about institutions with medical schools? Do we aspire to have the research expenditures of a flagship R1? Choosing aspirant institutions means first choosing the outcome we aspire to improve, then identifying institutions, divisions, colleges, or programs that are comparable to us in other ways but outpace us on the outcome of interest (e.g., research expenditures).

This process can still be used to establish an aspirant list. Here, your purpose is to identify the outcome on which we aspire to improve, then follow the rest of the steps to establish a set of institutions with levels of that outcome above ours.

Step 3

Determine the population of institutions

Once you have articulated the outcome upon which you want to benchmark JMU against other institutions, determine the population from which the peers will be drawn. If you only desire institutions outside of Virginia or wish to exclude institutions with a medical school, decide upon these parameters before exploring additional variables.

In essence, this step is meant to determine the non-negotiables—the factors that if all other things were equal about JMU and this institution, we still wouldn't consider them a peer. A common non-negotiable is a two-year college designation. That is, consider a two-year institution that was exactly like JMU in every other way (size, student demographics, location, etc.), would we consider them a peer? It is likely not because our mission, admissions standards, and other factors are so different from that of a two-year institution, it wouldn't make sense to consider them a peer under most circumstances.

Other common factors to consider when considering the population of possible peers:

- Private institutions?
- Medical Schools?
- Two-year colleges?
- MHBCUs or HSIs?

Consider this the step at which you are filtering out institutions based on a categorical factor. Private or Public. Medical school, no medical school. Later, you'll identify variables that are

continuous in nature (number of students, graduation rates), but at this point, you're considering the basic characteristics that might exclude an institution from being considered a peer. Be aware that choosing too many filters at this step may severely limit the number of institutions from which to choose. You are encouraged to use the process outlined in Step 4 to help you decide which of these categorical variables are most relevant to apply.

Action Item: Use the following checklist to determine what institutions to exclude based on specific characteristics. Download Checklist (.docx)

Which of the following types of institutions should be considered for inclusion in your peer group?	Include?	
Two-year colleges	Yes	No
Private institutions	Yes	No
Historically Black Colleges or Universities (HBCUs)	Yes	No
Hispanic Serving Institutions (HSIs)	Yes	No
Institutions with Medical Schools	Yes	No
Urban institutions	Yes	No
Non-Research Institutions (based on Carnegie Classifications)	Yes	No
	Yes	No

Step 4

Select a preliminary set of variables

Once you've determined that a peer group needs to be created and considered some initial parameters to help limit the types of institutions to include, submit a request to the office of Planning, Analytics, and Institutional Research (PAIR). The PAIR team will work with you to identify variables the university (or your unit/group) wants to use to develop its peers. These variables are the characteristics you want to use to establish your peers.

The process for selecting variables can be lengthy and involves thoughtful consideration on the part of your group/the institution. Peer groups will vary widely depending on the variables used in the analysis, so it's important that you consider the following when determining the characteristics used to develop a set of peers:

How does this variable contribute to a useful benchmarking on the outcome in question?

The variables you use to develop your peer group should be relevant to the reason you're trying to develop a benchmarking group in the first place. For instance, if you want to develop a peer group to benchmark JMU's endowment against other institutions, then the variables you choose to include

should reflect institutional characteristics such as average family income, number of degrees awarded, and types of programs offered. A combination of these variables may illustrate institutions that should have similar factors influencing an endowment's size. Choosing other variables such as percent of full-time faculty, institutional location, or graduation rates may produce a much different list of institutions that will yield highly different endowment sizes, making the ability to benchmark appropriately more difficult.

Is data for the variable readily available for ALL institutions in your population of interest? (see Step 3)

Often, you may want to include a variable that we track at JMU, but that isn't available in the limited number of publicly available datasets. For instance, you may want to compare JMU against institutions with similar of first-generation students. However, first-generation status is not a variable that exists in a comparative dataset and thus, we cannot compile data across all possible institutions.

Action Item: Submit a request to PAIR to assist you with answering this question.

Are any of the variables you want to use similar to each other or to the outcome in question?

Example: You want to benchmark JMU against peers to see how our graduation rate stacks up. You want to include retention rates as one of your variables. Because retention rates are highly correlated with graduation rates, including this variable may influence your ability to benchmark effectively.

Similarly, using two correlated variables may skew your peers towards those with these characteristics. If you want to include both retention and graduation rates as variables, you may skew the institutions included to those with high student success outcomes. In this case, you may want to choose either retention or graduation but not both.

Action Item: Involve constituents to select variables.

When determining variables to include in the analysis, it's important to consider the constituents that have a vested interest in the peer group or outcome being measured. To that end, this is the first of two points in the peer group development process where stakeholder feedback should be sought.

We recommend the following strategy to collect feedback on variables:

A. Following the process outlined in Step 4, generate a list of any possible variable you might want to include. At this point, do not worry about whether data exists, or a variable might be correlated with the measure of interest. Although you don't want 100 variables, it's okay if this list includes 25-30 variables.
Separate variables that offer concrete categories like the ones you identified in Step 3 (Private vs Public, Medical School vs No Medical School) from those that are continuous in nature (enrollment, endowment size, etc.).

B. Share the list with any core team, task force, or leadership group who has a vested interest in the peer group. For instance, if the measure of interest is faculty salaries, then share the

variable list with the Compensation Advisory Council, Deans, Faculty Senate, and other leadership teams from academic affairs.

In some cases, this may have already been done in part A. Ask each member of the group to choose no more than 10 continuous variables for inclusion. In other words, of the 25 variables shown, what are the most important variables that each member thinks should be included? As a separate item, ask them to identify the top three categorical variables that might be used as filters (see Step 3 for description). This survey can be done on paper, or you can generate a short survey using Qualtrics or QuestionPro. See a screenshot below for an example of how you might structure this survey.

C. Once each group member provides their list of the top 10 continuous variables and top three categorical variables, tally the results to see which variables receive the most consensus support. It is likely that everyone will agree on some variables, while others will be less popular. Ultimately, identify the top 10-15 continuous variables that received the most support and the top three categorical variables that the group thinks should be used to filter out institutions.

D. Share the list of consensus variables with whatever team or group is leading the peer group development effort. We recommend sharing the list of all variables that received votes and allow members to add support for variables that didn't make the top list of consensus variables. Require group consensus, though, before adding or removing any additional variables at this point. You still want to limit your final list to 12-15 variables, as some may need to be removed for reasons outlined in Steps 5 and 6.

Please review the list below and select **up to 10 metrics** that should be used to create a comparative institutional peer group for JMU. Your choices should reflect general metrics that you consider to be important descriptive characteristics of a university. Please consider your choices within the larger university context and not within a more narrow framework such as a specific college, program, or unit.

Hover over the *(i)* to see a definition of the metric. The sources of data for the metrics come from the U.S. Dept of Education's Integrated Post-Secondary Education Data System (IPEDS) and the NSF's Higher Education Research and Development Survey. Additional details for certain metrics can be found in the IPEDS glossary or the HERD survey

- [ ] Public funding per FTE *(i)*

- [ ] Percent of instructional faculty who are full-time *(i)*

- [ ] Instructional faculty (FTE) *(i)*

- [ ] Total enrollment (headcount) *(i)*

- [ ] Total enrollment (FTE) *(i)*

- [ ] Percent of undergraduates awarded Pell Grant *(i)*

- [ ] Number of completions by award level *(i)*

There are additional metrics that will act as filters for creating an institutional peer group. Different from the list above, the following metrics will be used to exclude institutions from considerations that don't meet certain criteria.

Please review the list below and select **up to five (5)** metrics that should be used to exclude certain types of institutions. Hover or tap on the (i) icon to see more details about the type of institutions that would be included/excluded if the metric were chosen.

Additional information about the Carnegie Classifications referenced can be found here.

☐ Population Served *(i)*

☐ Residential Classification *(i)* |

☐ Medical School/No Medical School *(i)*

☐ Athletic Classification *(i)*

☐ Public/Private *(i)*

Are there metrics you believe should be considered that are NOT present on the list above?

As a reminder, the set of metrics shown has already been narrowed from a larger set of variables by the Institutional Peers Task Force. The list contained metrics that are commonly used in institutional peer group analyses and for which data are consistently and widely available across higher education institutions. Recognize that to be included, any metric must be widely available, not just for JMU, but for most four-year institutions in the U.S. If possible, please include a link to the dataset or data source containing your suggested metric and comparative data for U.S. institutions.

○ Describe the additional metric(s) |
_____

○ Provide the link(s) if available to the data source(s) where comparative data can be found _____

At this point, you would ideally have around 12-15 preliminary continuous variables to analyze, and three to four variables used to filter the initial population or the measure of interest. It is not recommended to use more than three to four categorical variables because otherwise, the population of possible institutions will become too small. It is better to have a few additional variables identified at this step as some variables may be excluded in the preliminary analysis (steps 5 and 6) for the following reasons:

- Data don't exist for other institutions (see Step 5)
- Data are missing for some institutions (see Step 5)
- Variable is too similar to another variable (see Step 6)
- Variable is too similar to the outcome or measure of interest (see Step 6)

Step 5

Confirm data are available and reliable for variables selected

Note that the type of analysis we use to form a peer group requires each institution included in the initial population of consideration contain non-null values for each variable selected. In other words, data needs to exist for every variable and every institution. Sometimes data is missing for institutions that would otherwise be excluded from consideration (private institutions, two-year schools). Thus, it's important to review why data might be missing before excluding the variable from consideration. If missing data are widespread, it may limit the initial population based on the data available.

Be aware that easily accessible data for higher education institutions is limited. PAIR will use data collected by IPEDS, an initiative of the US Department of Education's National Center for Education Statistics, due to the wide range of information collected from colleges and universities annually. This data is also imported annually in PAIR's data warehouse environment allowing it to be queried for analysis. It is by far the most comprehensive source for readily available comparison data of higher education institutions. PAIR hosts a [webpage](#) with links to other possible data sources. Not all of the sources listed there have downloadable data sets.

While these sources offer data for a wide breadth of institutions, it is not guaranteed that any of them will have data for all institutions for specific variables of interest. If you would like to use data from a source that PAIR does not have access to, you are responsible for collecting the data and adding it to a template provided by PAIR. This template will help the PAIR office incorporate this data more efficiently into the full dataset used in analysis. PAIR will, unless otherwise instructed, use data from the most recent IPEDS collection year available.

[Download Data Template (.xslx)](#)

Action Item: Consult with PAIR to review available data for your selected variables.

Step 6

Analyze relationships between variables

PAIR will ensure that the variables selected are not highly correlated with each other. For instance, it would not be appropriate to use "Number of Enrolled Undergraduate Students" and "Total Enrolled Students" because total enrolled will likely be highly related to the number of enrolled undergraduates. If two or more of the variables are highly correlated with each other (>=0.9), it could cause undesired weighting in the analysis. Basically, if two variables are highly correlated then using both would be the same as using only one and weighting it twice in the analysis. Once

the initial variables are identified, PAIR staff will review the data to identify any potential issues with highly correlated variables and can advise you on how to identify variables that may better address your needs.

Once the selected variables have been reviewed for completeness (Step 5) and correlations (Step 6), the final step before analysis is to decide whether any variables are "more important" in the analysis. This is the second point in the process where constituent feedback can be helpful.

Step 7

Assign weights to the final list of variables

Once the final variable set is chosen, PAIR will help you assign weight values to variables based on their importance in considering a peer group. For example, if you felt that it would be more important for a peer group to be similar to JMU in graduation rates than the size of its student body, you might assign a value of 20 (indicating 20%) to the graduation rate variable and only 10 to the enrollment size. The total value of the assigned weights should equal roughly 100 across all variables. It is also possible to not assign any weight values if you view each variable to be of equal importance.

Action Item: Involve constituents to assign weights (optional).

We recommend following these steps to determine the final weights, if desired:

A. Create a list of the final continuous variables that will be considered. You do not need to weight the categorical (i.e., filtering) variables.

B. Request that the same constituents that provided input on the selection of variables now "assign" values to the variables to indicate the importance of each variable towards the development of the peer group.

   This step can be done in person during a meeting or retreat. If there is not an opportunity to get this feedback in person, or if the number of people from which you are seeking feedback is too broad, this step can be accomplished in a one question survey. (see snapshot)

Please review the list below and assign _99 points_ across the metrics (100 doesn't divide well into nine metrics).

If you think each metric should be considered equally when determining the peer group, then assign each metric 11 points. If you think certain metrics should be weighted more heavily, then assign more points to one or more metrics, while assigning fewer points to others. The total number of points assigned must equal 99.

Remember, assigning higher point values to a metric means it is more important that JMU's peer group include institutions that are similar to us on that specific metric. Please consider your choices within the larger university context and not within a more narrow framework such as a specific college, program, or unit.

Again, please make sure your points total to 99.

Hover over the *(i)* to see a definition of the metric.

Graduation Rate *(i)*: _____
Instructional faculty (FTE) *(i)*: _____
Percent of instructional faculty who are full-time *(i)*: _____
Total enrollment (headcount) *(i)*: _____
Percent of full-time students *(i)*: _____
Percent of undergraduate students *(i)*: _____
Public funding per FTE *(i)*: _____
Research expenditures *(i)*: _____
Percent of undergraduates awarded Pell Grant *(i)*: _____
Total: _____

1. Divide the total number of variables into 100. This number is the default value assigned to a variable that should not be considered more important than another. If the number of variables you have is different than ten, consider adjusting the total number of points so that the default value is a whole number. See chart below for recommendations:

Number of variables	Total points	Default value per variable
15	105	7
14	98	7
13	104	8
12	96	8
11	99	9
10	100	10
9	99	11
8	96	12

2. Ask constituents to assign values to each variable so that the total number of points assigned is equivalent to the "Total Points" column in the table above. If the respondent does not believe any variable should be weighted more heavily in the analysis, then they should assign the appropriate "default value per variable" to each variable. Variables that receive more points indicate characteristics that are more important. As an example, if a respondent believes that it is more important for a JMU peer to have similar research expenditures than enrollment size, they would assign more points to a "research expenditures" variable and fewer points to a "total enrollment." In essence, what this decision indicates is that if an institution was the same size as JMU but had drastically different research expenditures, we would be less likely to count them as a peer than an institution with similar research expenditures but that was drastically smaller or larger than JMU.

C. After you have received the scores assigned from each individual constituent, the final step is to average the scores for each variable to come up with a final variable weight.
As an example, see the table below for values associated with three variables. Here, the total score was 30.

Respondent	Variable 1 (weight)	Variable 2 (weight)	Variable 3 (weight)	Total
1	8	14	8	30
2	12	10	8	30
3	10	10	10	30
4	9	11	10	30
5	18	8	4	30
Average	11.4	10.6	8	10

In this example, you can see that for each respondent, the total points assigned across the three values all equal 30. Respondent 1 felt that Variable 2 should receive more consideration in the formation of a peer group than either Variable 1 or Variable 3. Respondent 3 felt that each variable should receive equal treatment. As a group, the average score for Variable 1 was 11.4, Variable 2 was 10.6, and Variable 3 was eight. Thus, overall, Variable 1 was considered the most important characteristic to consider when choosing peers. Although everyone had slightly different considerations, the average weight provides a way to quantify the weights without the more difficult task of reaching consensus among the entire group.

Note that this approach also allows certain weights to be removed as outliers if they are drastically different from most of those assigned. Respondent 5 assigned a very high weight to Variable 1. When calculating the average, this type of lopsided assignment has the potential to skew the average for a particular variable, possibly assigning it a weight that is more heavily influenced by a single respondent. PAIR can work with you to help identify whether these anomalies exist and to consider whether to remove them before doing the analysis. Removal should be done sparingly, though, as there should not be an attempt to influence the results without just cause.

Step 8

Conduct analysis

Once variables and weights have been finalized, the PAIR team will conduct an analysis that takes both the variables and weights into consideration to craft a list of possible peers. To determine peer institutions, PAIR will use the statistical analysis package R to create a distance matrix capturing pairwise distance between JMU and each institution in the final population. A distance matrix is a way to systematically quantify similarity or dissimilarity between pairs of objects (e.g., JMU and another institution). The distance matrix is calculated using Euclidean distance, which is a way to measure "straight line" difference between two points in space.

Action Item: Consult with PAIR

From this analysis, PAIR will develop a list of institutions ordered by their distance from JMU. The smaller the distance, the more similar the institution is to JMU, based on the specific set of variables and weights.

## Step 9

Create final list of peers

Once the population of institutions is sorted in ascending order by distance (smaller distances indicate greater similarity to JMU), PAIR will provide a bar graph that clearly illustrates the total pairwise distance between JMU and each institution in the final population. PAIR will then recommend the number of institutions to be included in the final peer group based on peer group requirements and the general breakdown of distance scores for each institution. Ideally, the peer group will include the Top 10- 20 institutions.
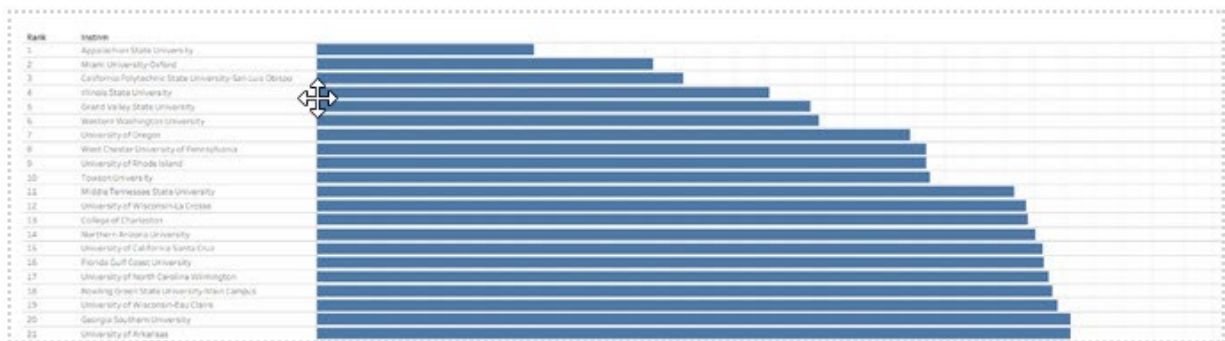
At this point, you may wish to share this list with any constituent groups that are intimately involved with the use of the peer group. A common occurrence at this stage is to "swap" institutions, replacing institutions with small distances with those farther down the list. This may occur if a constituent has a specific awareness of a school that they consider "to be like JMU." Further, an institution may not seem like a good fit on the surface. We can visualize the distances of a peer institution from JMU on a specific variable using a radar plot. This visualization helps decision-makers view the "distance" between a comparison school and JMU on each variable to better

understand the ways in which the comparison school was most similar and dissimilar to JMU.

To see how a radar plot can be used to understand why a particular institution was included, consider the following example. When the JMU task force was developing a characteristically similar peer group to JMU, members questioned the appearance of an R1 institution on the list (highest research). While JMU was dissimilar from this institution on the "research expenditures" variable, it was very similar to it on several of the other variables used in the analysis. The radar plot shown below illustrates this point. Thus, anyone reviewing the final list must understand that the peers are established based on the combination of ALL the variables included in the analysis.

Peer Institution: University of Oregon
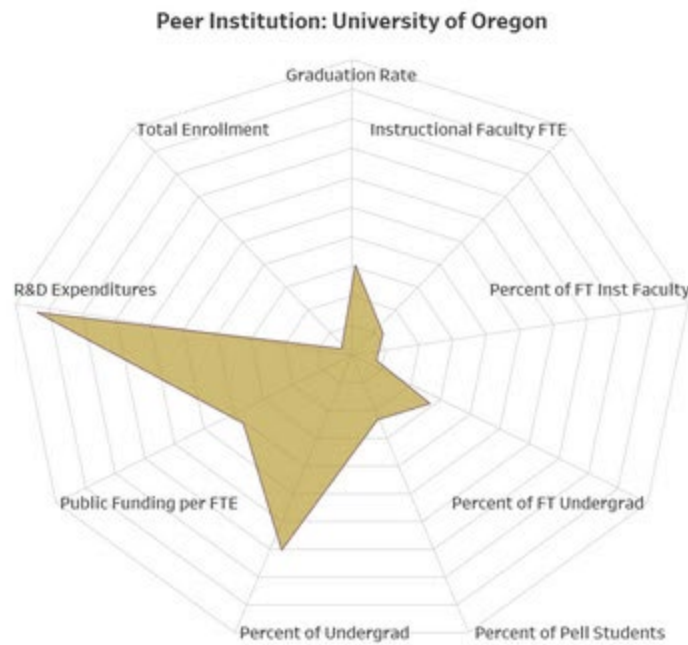
If done well, the process to involve constituents in the selection of the variables and weights produces a peer group that meets the specific needs of the study. This process also avoids "swapping" based on individual preferences or the perceived lack of face validity (i.e., this institution cannot be a peer because it doesn't look like us). For that reason, PAIR does not recommend "swapping" as a common practice. Any challenges to the top members of the peer group should cause questions about whether the variables or weights were chosen correctly, in which case, the group should return to Step 4 in the process.