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External Analysis Report

Western New Mexico University

11/1/2021 - 12/1/2021

Total Tests = 17

Outbound = 17

Academic Level: Bachelors

Aggregates: AACSB Accredited - The Assoc. to Advance Collegiate Schools of Business
AACSB Members - The Assoc. to Advance Collegiate Schools of Business
ACBSP (US) - Accreditation Council for Business Schools and Programs
ACBSP Region 6 (Southwestern Council)

Course Outbound: Exit Business Assessment Test

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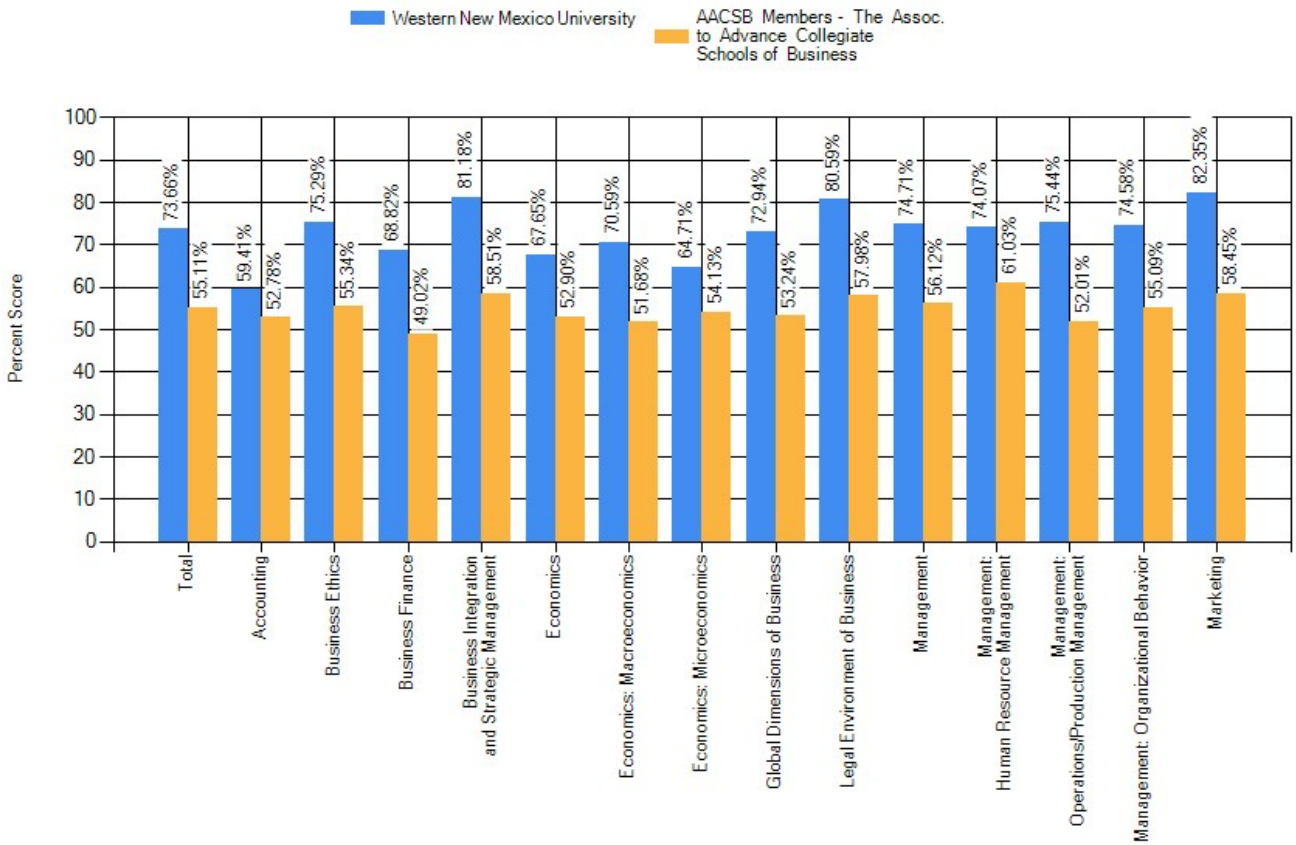
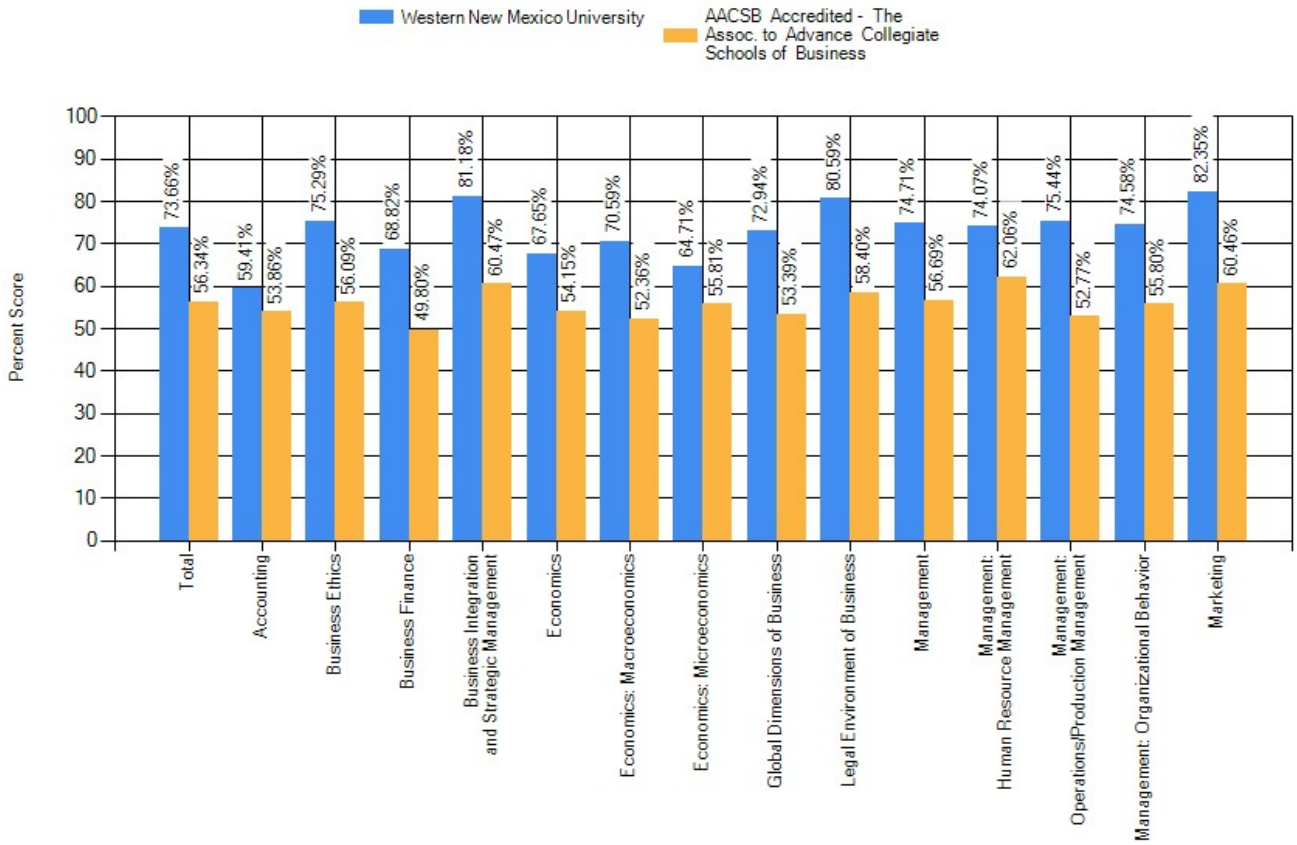
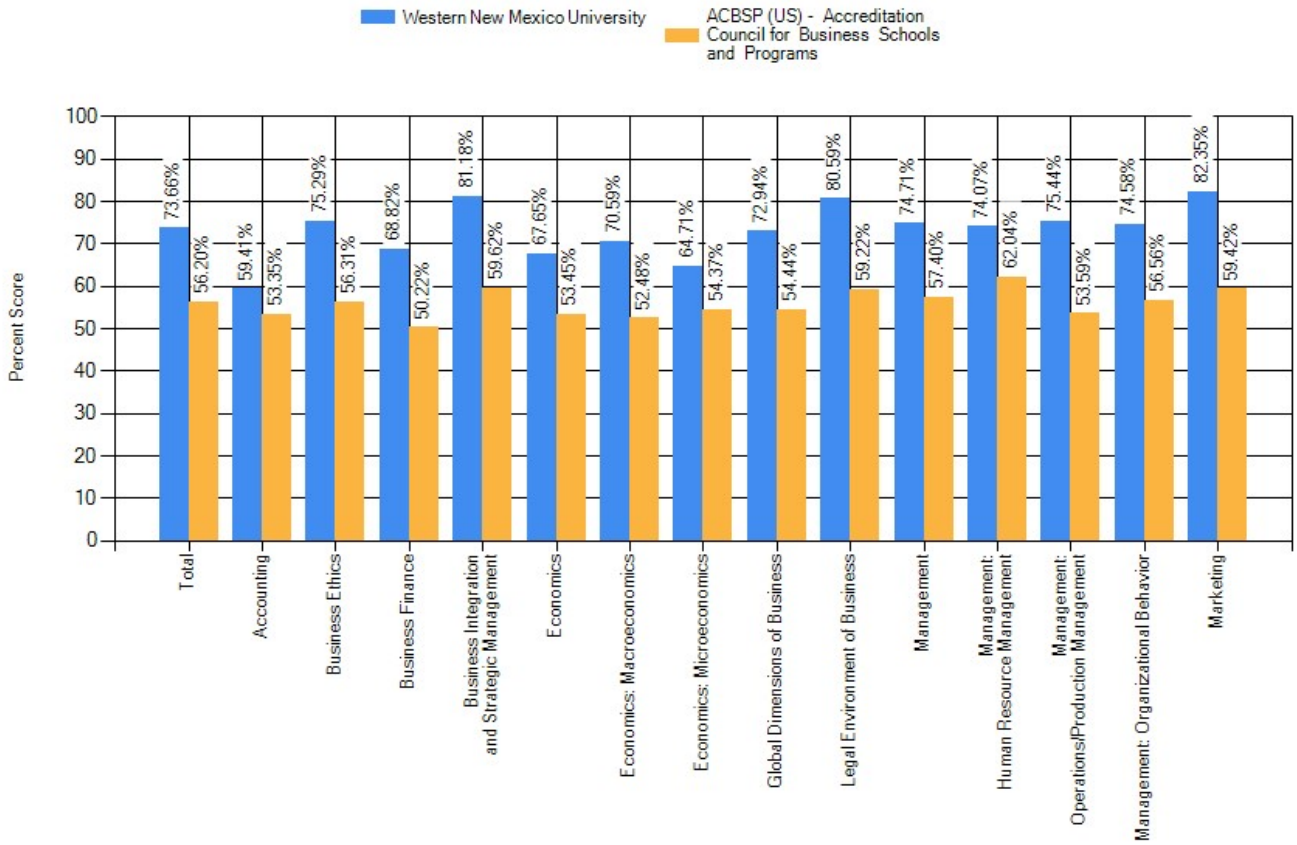
Overview: Outbound Exam Results Compared to the Aggregate Pool for AACSB Members - The Assoc. to Advance Collegiate Schools of Business Programs



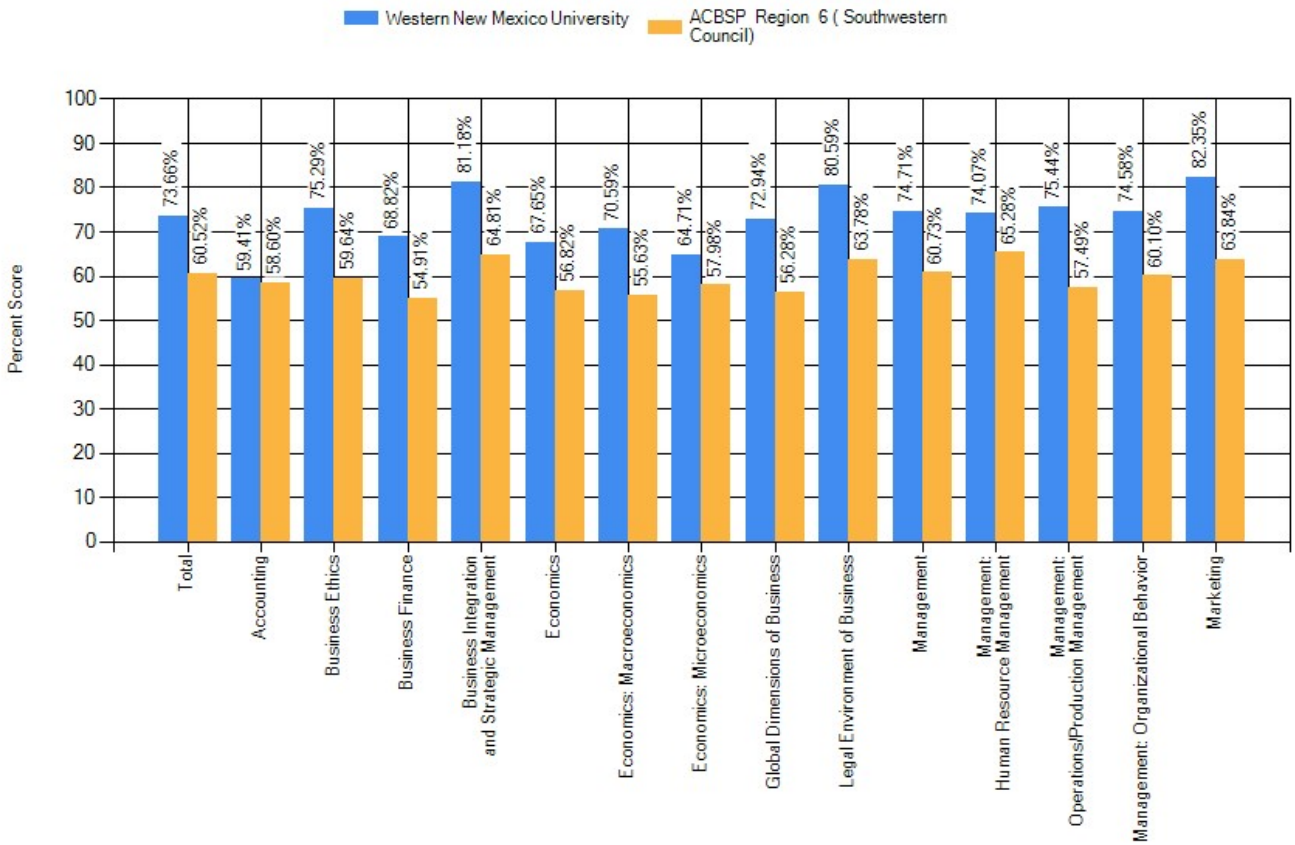
Overview: Outbound Exam Results Compared to the Aggregate Pool for AACSB Accredited - The Assoc. to Advance Collegiate Schools of Business Programs



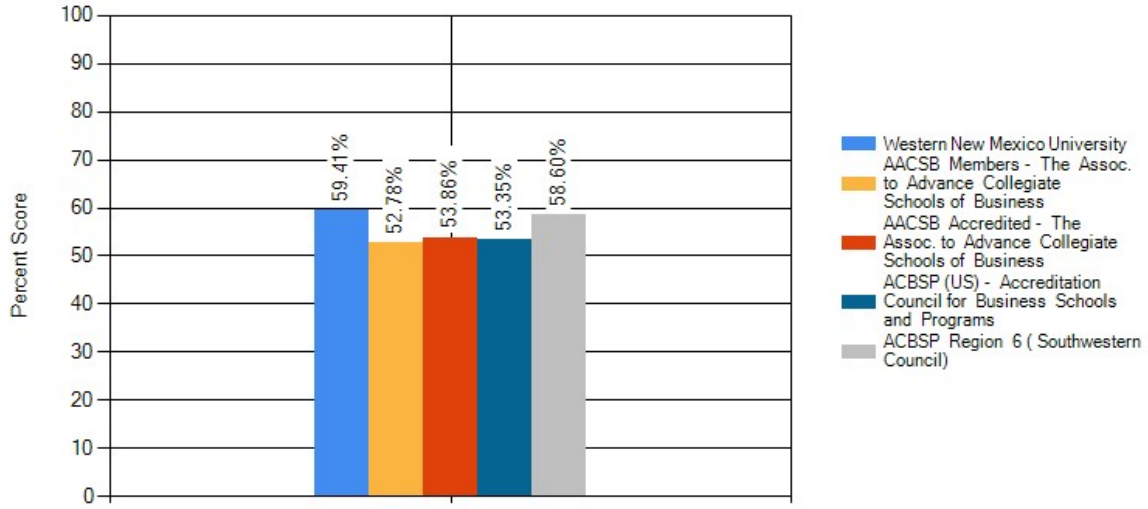
Overview: Outbound Exam Results Compared to the Aggregate Pool for ACBSP (US) - Accreditation Council for Business Schools and Programs Programs



Overview: Outbound Exam Results Compared to the ___ Aggregate Pool for ACBSP Region 6 (Southwestern Council) Programs



Comparison of Outbound Exam Results with Outbound Exam Aggregate Results: Accounting



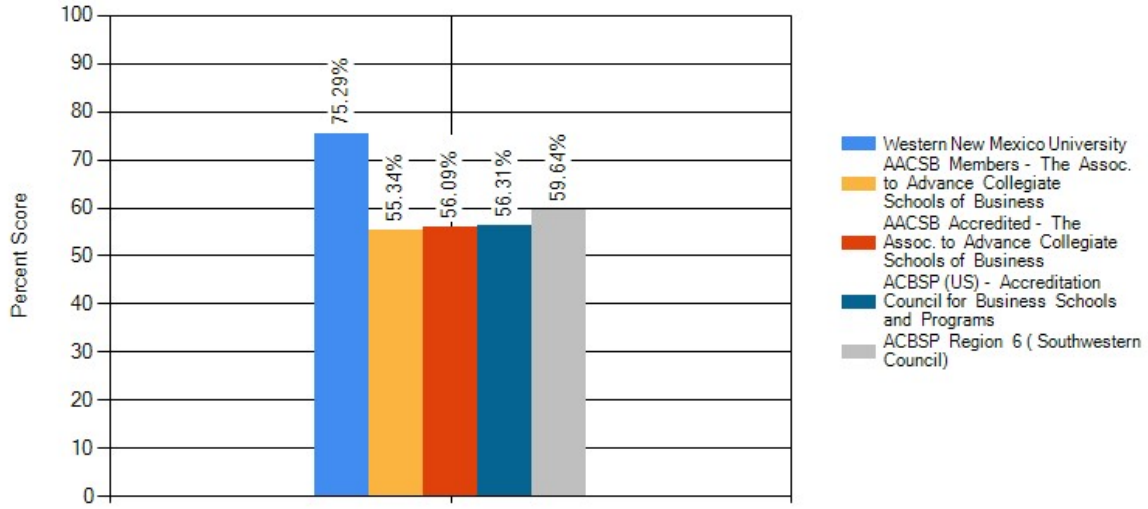
6.63% Difference with the AACSB Members - The Assoc. to Advance Collegiate Schools of Business Aggregate

5.55% Difference with the AACSB Accredited - The Assoc. to Advance Collegiate Schools of Business Aggregate

6.06% Difference with the ACBSP (US) - Accreditation Council for Business Schools and Programs Aggregate

0.81% Difference with the ACBSP Region 6 (Southwestern Council) Aggregate

Comparison of Outbound Exam Results with Outbound Exam Aggregate Results: Business Ethics



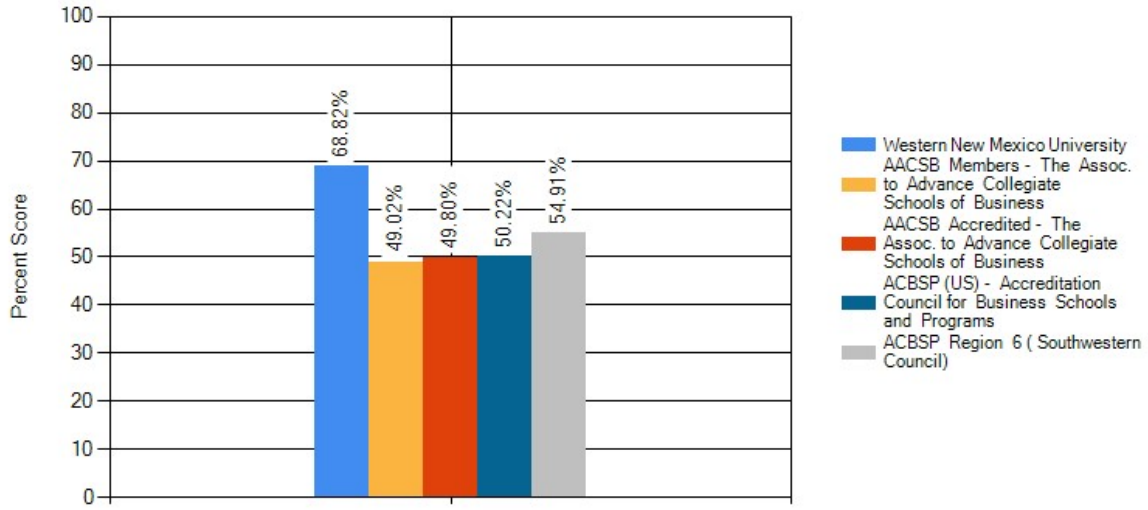
19.95% Difference with the AACSB Members - The Assoc. to Advance Collegiate Schools of Business Aggregate

19.20% Difference with the AACSB Accredited - The Assoc. to Advance Collegiate Schools of Business Aggregate

18.98% Difference with the ACBSP (US) - Accreditation Council for Business Schools and Programs Aggregate

15.65% Difference with the ACBSP Region 6 (Southwestern Council) Aggregate

Comparison of Outbound Exam Results with Outbound Exam Aggregate Results: Business Finance



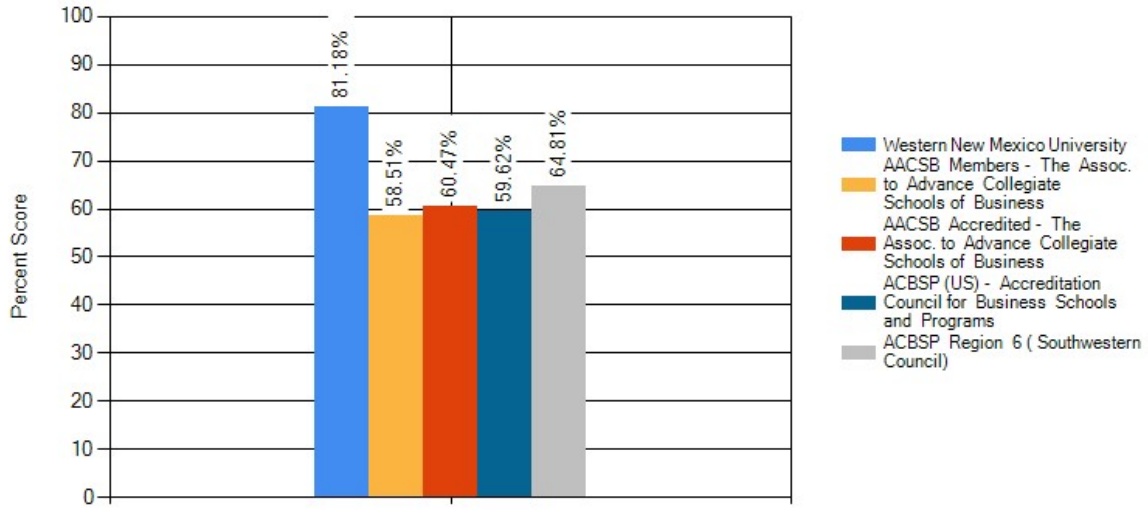
19.80% Difference with the AACSB Members - The Assoc. to Advance Collegiate Schools of Business Aggregate

19.02% Difference with the AACSB Accredited - The Assoc. to Advance Collegiate Schools of Business Aggregate

18.60% Difference with the ACBSP (US) - Accreditation Council for Business Schools and Programs Aggregate

13.91% Difference with the ACBSP Region 6 (Southwestern Council) Aggregate

Comparison of Outbound Exam Results with Outbound Exam Aggregate Results: Business Integration and Strategic Management



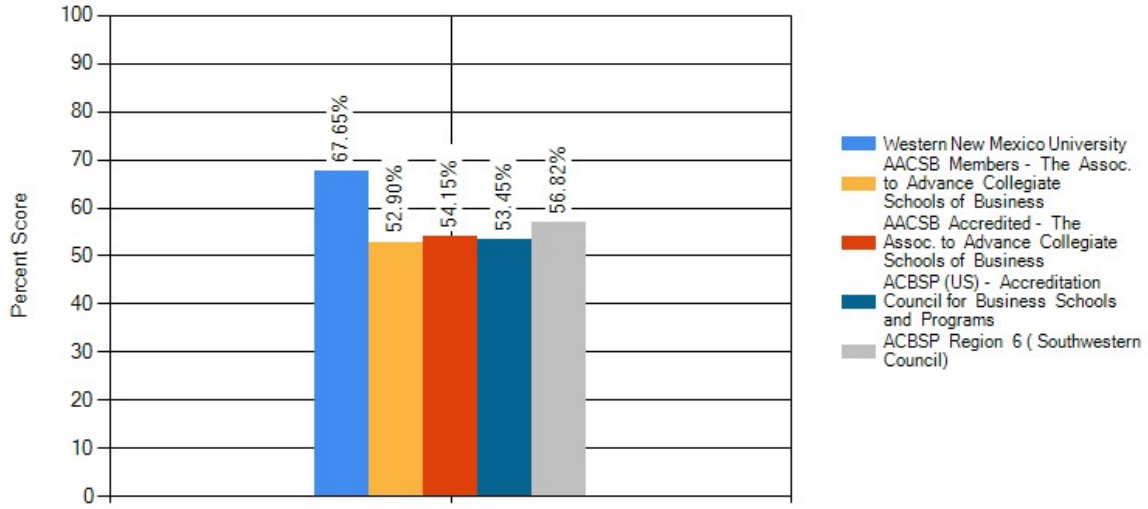
22.67% Difference with the AACSB Members - The Assoc. to Advance Collegiate Schools of Business Aggregate

20.71% Difference with the AACSB Accredited - The Assoc. to Advance Collegiate Schools of Business Aggregate

21.56% Difference with the ACBSP (US) - Accreditation Council for Business Schools and Programs Aggregate

16.37% Difference with the ACBSP Region 6 (Southwestern Council) Aggregate

Comparison of Outbound Exam Results with Outbound Exam Aggregate Results: Economics



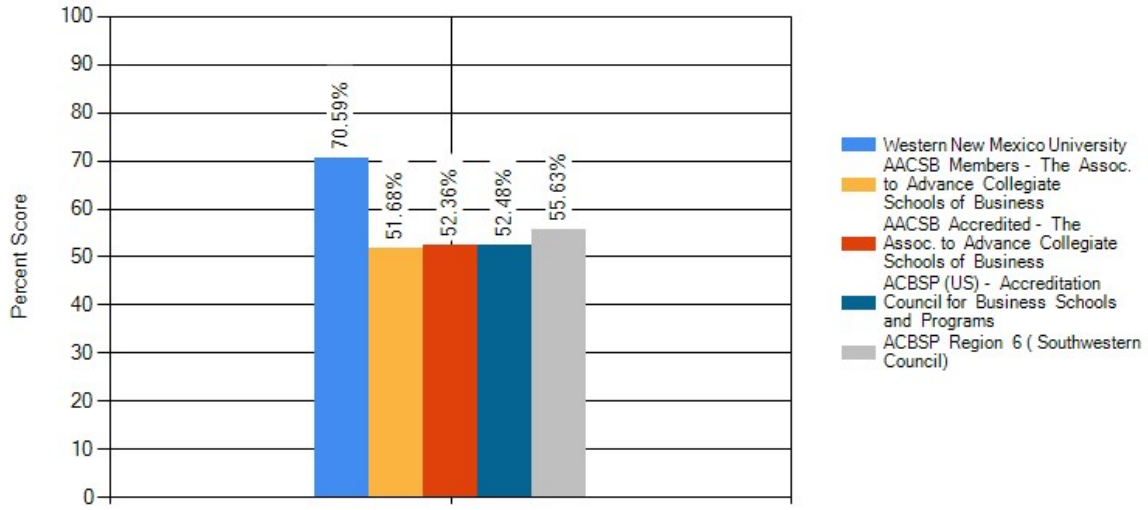
14.75% Difference with the AACSB Members - The Assoc. to Advance Collegiate Schools of Business Aggregate

13.50% Difference with the AACSB Accredited - The Assoc. to Advance Collegiate Schools of Business Aggregate

14.20% Difference with the ACBSP (US) - Accreditation Council for Business Schools and Programs Aggregate

10.83% Difference with the ACBSP Region 6 (Southwestern Council) Aggregate

Comparison of Outbound Exam Results with Outbound Exam Aggregate Results: Economics: Macroeconomics



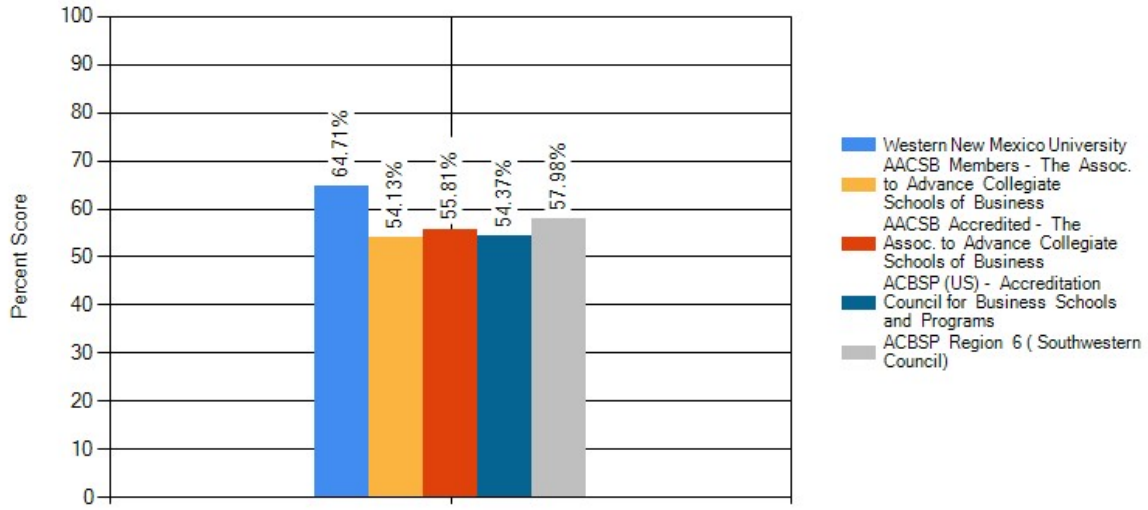
18.91% Difference with the AACSB Members - The Assoc. to Advance Collegiate Schools of Business Aggregate

18.23% Difference with the AACSB Accredited - The Assoc. to Advance Collegiate Schools of Business Aggregate

18.11% Difference with the ACBSP (US) - Accreditation Council for Business Schools and Programs Aggregate

14.96% Difference with the ACBSP Region 6 (Southwestern Council) Aggregate

Comparison of Outbound Exam Results with Outbound Exam Aggregate Results: Economics: Microeconomics



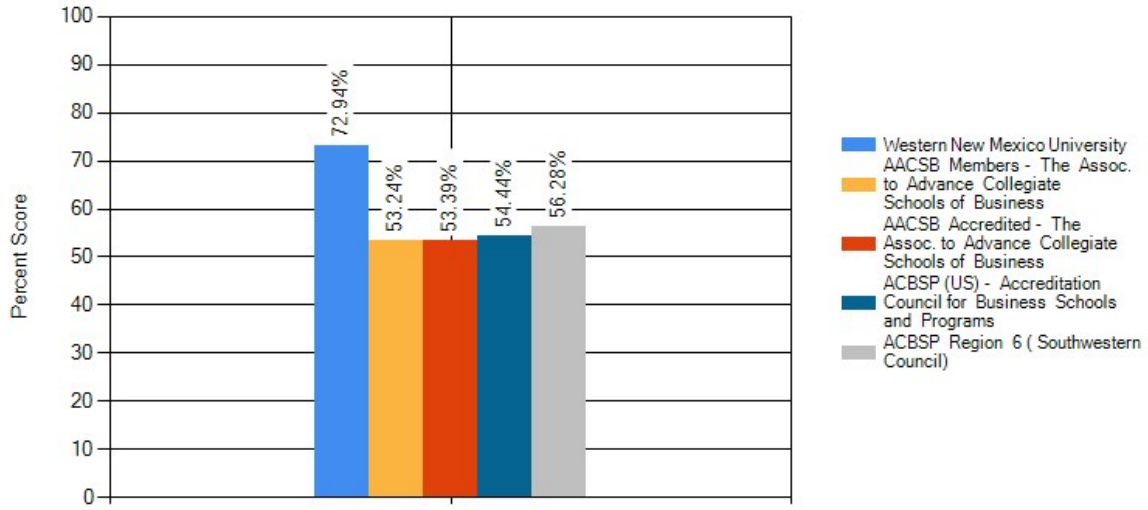
10.58% Difference with the AACSB Members - The Assoc. to Advance Collegiate Schools of Business Aggregate

8.90% Difference with the AACSB Accredited - The Assoc. to Advance Collegiate Schools of Business Aggregate

10.34% Difference with the ACBSP (US) - Accreditation Council for Business Schools and Programs Aggregate

6.73% Difference with the ACBSP Region 6 (Southwestern Council) Aggregate

Comparison of Outbound Exam Results with Outbound Exam Aggregate Results: Global Dimensions of Business



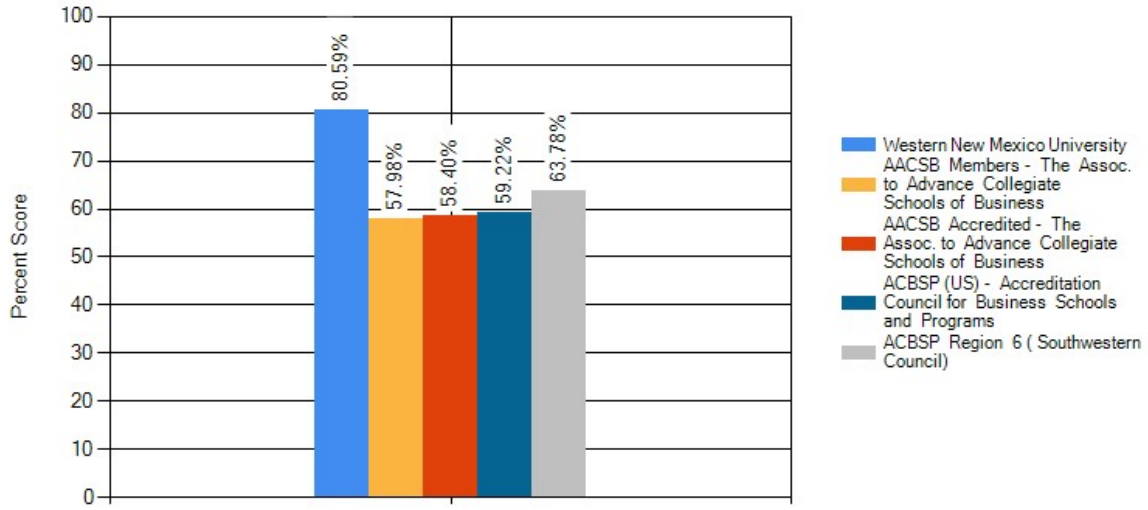
19.70% Difference with the AACSB Members - The Assoc. to Advance Collegiate Schools of Business Aggregate

19.55% Difference with the AACSB Accredited - The Assoc. to Advance Collegiate Schools of Business Aggregate

18.50% Difference with the ACBSP (US) - Accreditation Council for Business Schools and Programs Aggregate

16.66% Difference with the ACBSP Region 6 (Southwestern Council) Aggregate

Comparison of Outbound Exam Results with Outbound Exam Aggregate Results: Legal Environment of Business



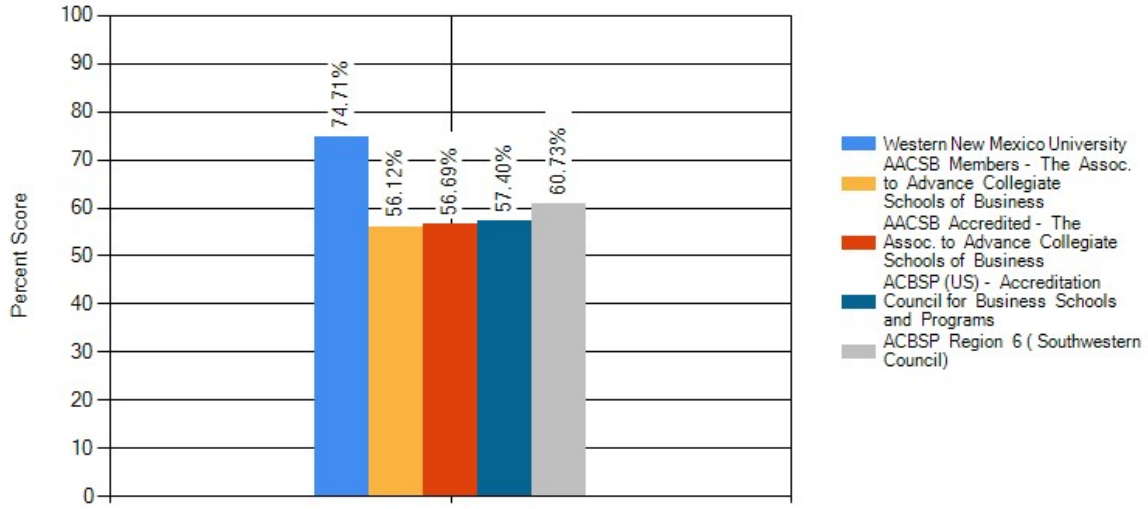
22.61% Difference with the AACSB Members - The Assoc. to Advance Collegiate Schools of Business Aggregate

22.19% Difference with the AACSB Accredited - The Assoc. to Advance Collegiate Schools of Business Aggregate

21.37% Difference with the ACBSP (US) - Accreditation Council for Business Schools and Programs Aggregate

16.81% Difference with the ACBSP Region 6 (Southwestern Council) Aggregate

Comparison of Outbound Exam Results with Outbound Exam Aggregate Results: Management



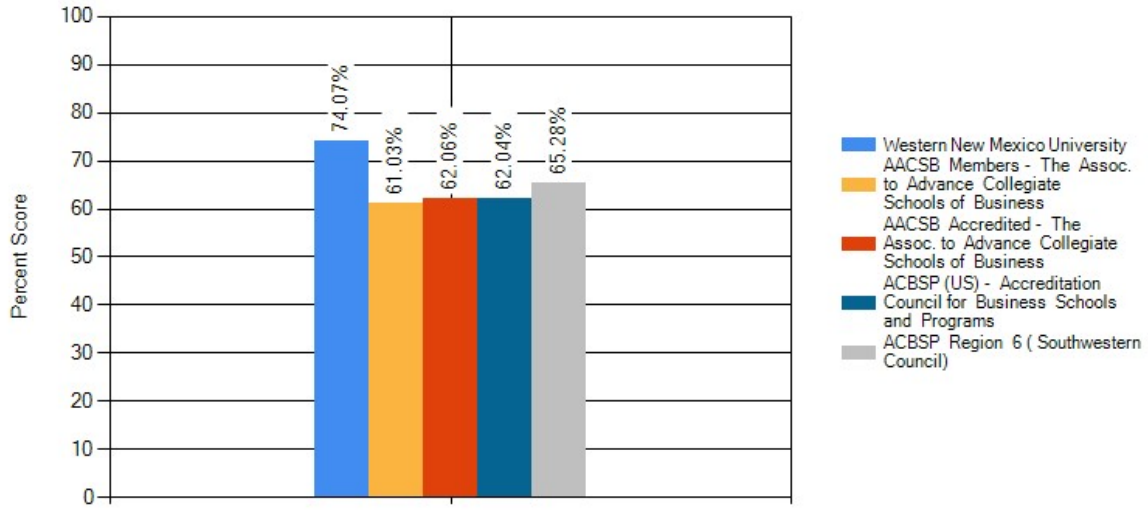
18.59% Difference with the AACSB Members - The Assoc. to Advance Collegiate Schools of Business Aggregate

18.02% Difference with the AACSB Accredited - The Assoc. to Advance Collegiate Schools of Business Aggregate

17.31% Difference with the ACBSP (US) - Accreditation Council for Business Schools and Programs Aggregate

13.98% Difference with the ACBSP Region 6 (Southwestern Council) Aggregate

Comparison of Outbound Exam Results with Outbound Exam Aggregate Results: Management: Human Resource Management



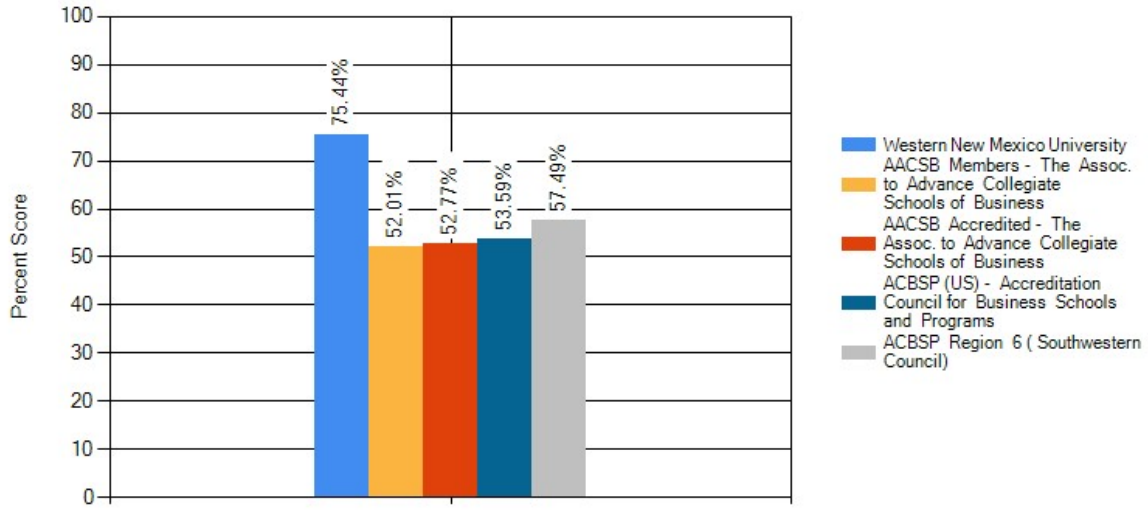
13.04% Difference with the AACSB Members - The Assoc. to Advance Collegiate Schools of Business Aggregate

12.01% Difference with the AACSB Accredited - The Assoc. to Advance Collegiate Schools of Business Aggregate

12.03% Difference with the ACBSP (US) - Accreditation Council for Business Schools and Programs Aggregate

8.79% Difference with the ACBSP Region 6 (Southwestern Council) Aggregate

Comparison of Outbound Exam Results with Outbound Exam Aggregate Results: Management: Operations/ Production Management



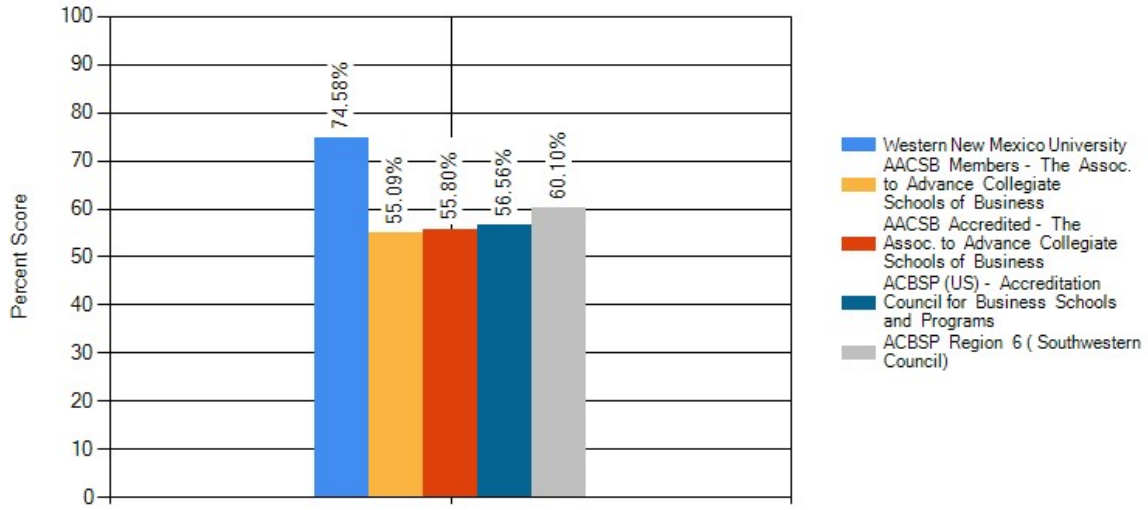
23.43% Difference with the AACSB Members - The Assoc. to Advance Collegiate Schools of Business Aggregate

22.67% Difference with the AACSB Accredited - The Assoc. to Advance Collegiate Schools of Business Aggregate

21.85% Difference with the ACBSP (US) - Accreditation Council for Business Schools and Programs Aggregate

17.95% Difference with the ACBSP Region 6 (Southwestern Council) Aggregate

Comparison of Outbound Exam Results with Outbound Exam Aggregate Results: Management: Organizational Behavior



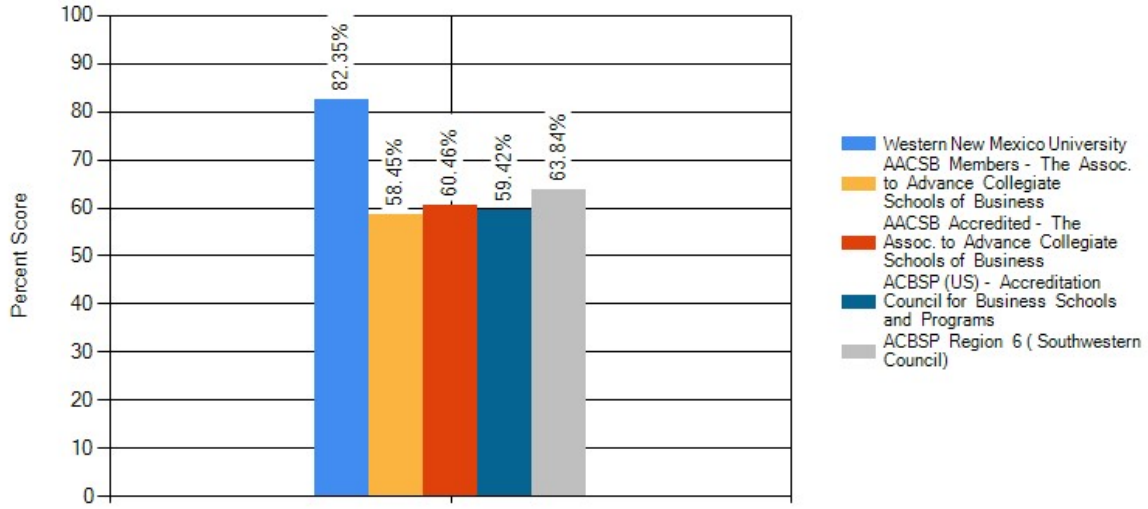
19.49% Difference with the AACSB Members - The Assoc. to Advance Collegiate Schools of Business Aggregate

18.78% Difference with the AACSB Accredited - The Assoc. to Advance Collegiate Schools of Business Aggregate

18.02% Difference with the ACBSP (US) - Accreditation Council for Business Schools and Programs Aggregate

14.48% Difference with the ACBSP Region 6 (Southwestern Council) Aggregate

Comparison of Outbound Exam Results with Outbound Exam Aggregate Results: Marketing



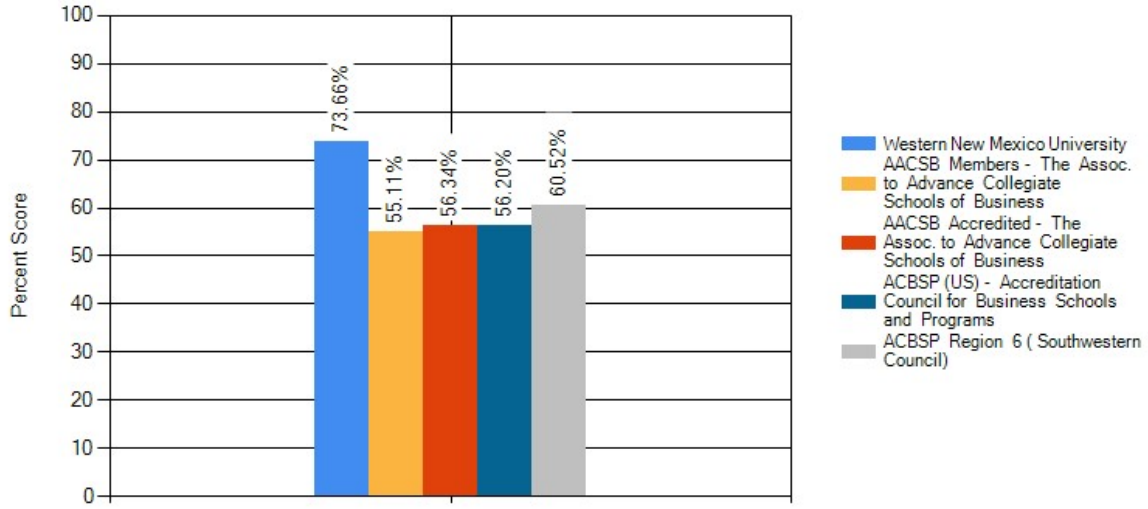
23.90% Difference with the AACSB Members - The Assoc. to Advance Collegiate Schools of Business Aggregate

21.89% Difference with the AACSB Accredited - The Assoc. to Advance Collegiate Schools of Business Aggregate

22.93% Difference with the ACBSP (US) - Accreditation Council for Business Schools and Programs Aggregate

18.51% Difference with the ACBSP Region 6 (Southwestern Council) Aggregate

Comparison of Outbound Exam Results with Outbound Exam Aggregate Results: Total



18.55% Difference with the AACSB Members - The Assoc. to Advance Collegiate Schools of Business Aggregate

17.32% Difference with the AACSB Accredited - The Assoc. to Advance Collegiate Schools of Business Aggregate

17.46% Difference with the ACBSP (US) - Accreditation Council for Business Schools and Programs Aggregate

13.14% Difference with the ACBSP Region 6 (Southwestern Council) Aggregate

Understanding and Using the Report

The purpose of the following analyses is to assist administrators, academic program managers, assessment coordinators, course managers, and other academic officials with program-level direct assessment of the institutional programs. These data should be used to assess the strengths and opportunities for improvement associated with the academic programs based upon the knowledge levels of the students regarding the foundational learning outcomes of the curriculum.

An Inbound/Outbound exam construct provides data for both internal and external benchmarking. The Inbound Exam evaluates the student's knowledge level towards the beginning of the student's program of study. The Outbound Exam assesses the student's knowledge level at the end of the student's program of study. The difference in results between the Inbound and Outbound Exams is the direct measure of learning most often used for internal benchmarking. Additional subject-level analysis compared to specific aggregate pools allows for both internal and external benchmarking.

The number of questions offered and the frequency correct value of the aggregates is based on the sampling of the data at each level (subject, topic, total) independent of each summary level. Meaning, the sum of the number of questions offered for a set of subjects may not equal the number of questions offered for the topic.

Outbound Exam results are relative. Outbound Exam relevancy is understood best in terms of the change in knowledge level from the time a student enters the program compared to when they graduate from the program.

If identified, cohort level analyses provide program administrators with comparative information based upon the student cohort groups that the school has identified. Side-by-side comparisons are shown to supplement program-level analysis.

External comparisons of outbound scores with the various aggregate pools should only be used as a relative index of how the assessed program compares with other programs. There is a high degree of variability between schools with respect to specific curriculums and areas of emphasis or concentrations. Comparisons include other schools with relatively similar student populations and educational delivery means, not necessarily based on the exact curriculum of the program (which would be nearly impossible and most likely unrealistic). Multiple pools can be selected for these comparisons.

There are two types of data analyses included within the report: Means of Scores Analysis and Analysis of Percent Correct:

a. **Means of Scores Analysis.** This is a simple mean whereby we take the scores, total, and divide by the number of scores. The sample then is either the schools' number of exams included in the report or the total number of completed exams in the aggregate pools.

b. **Analysis of Percent Correct.** This is a total figure used whereby we take the total number of questions answered correctly (either at the Subject, Sub-topic, or Topic levels) and divided by the total number of questions offered, expressed as a percentage. A set of exam results is treated as one set of data/sample. These results are then compared to the aggregate pool results, which are similarly calculated.

For percentile ranking calculations and for the percentile benchmarks shown for the selected aggregate pool, results are subject to sample size limitations. In general, percentile ranking and percentile benchmarks should be used with caution relative to making programmatic changes based on the results if the sample of Questions Offered for the aggregate pool is less than 300 for a specific subject.

Average Total Score Percentile. Because not all exams include the same set of topics, a percentile value based on the Exam Total scores cannot be calculated with statistical precision. Most client schools customize the exams using topic selection and some include an internally developed topic. Therefore, the Average Total Score Percentile values are calculated as a simple mean of the topic percentile values. The Average Total Score Percentile values are shown only to provide a relative comparison of the Total Score.

Tips, Techniques, and Suggestions for Applying the Results of this Report for Academic Program-level Analysis and Continuous Improvement

The following tips, techniques, and suggestions for understanding and applying the results presented in this report for academic program-level analysis and continuous improvement are based on our years of experience in working with our client institutions, meeting with academic officials to review the results, and lessons learned from the accreditation institutions.

Reviewing the Results

- Topic and sub-topic level scores tend to be more significant in terms of analysis value than the total score. Although most exams include all available topics, not all exams will include all available topics. Therefore, the total score comparisons are shown for relative benchmarking whereas the topic and sub-topic level score comparisons will tend to be more meaningful in terms of understanding relevancy of the scores.
- If there are topics included on the exam that do not appear to be directly related to your curriculum and/or learning outcomes, consider removing these topics from future testing. It is generally best not to test on topics that are not included in the program's curriculum.
- We have an Aggregate Extraction report available that includes the aggregate pool summary data that is used for comparison analysis purposes. This report is available to you on your Client Administration site under the menu item *Reports*
- Consider the sample size for the exam period before making changes in the program based on the exam results. Lower sample sizes tend to have higher standard deviations. In general, it is best to have a sample of at least 100 exams before the results can be used for program changes. Since report period is a variable, we can go back and include past exam results for future reporting in order to get the sample size high enough for meaningful analysis.

Learning Outcome Analysis

- To evaluate the institution's learning outcomes, consider the table shown for each topic the frequency of questions correct. These data are most useful when considering learning outcome.
- Not every subject included on the exam will directly correspond to a program's learning outcome because this is a standardized test meant to apply to the widest diversity of programs. Therefore, the score for the topic or subtopic must be taking in the context of the subject-level analysis. For example, a relatively low topic/sub-topic score may be acceptable provided that the subject-level scores are high for those subjects that are directly related to learning outcomes. Conversely, a high topic/sub-topic score may be unacceptable if the questions missed on the exam were high for key learning outcomes.

Continuous Improvement

- It is important not to make too many changes in a program at the same time based on one or two exam periods. Instead, it it generally better to make small incremental changes to the program based on these results and then monitor the results to assess the consequences of the change effort.
- Specific ideas for continuous improvement include:
    - Updating course content to include more case study type instruction that combines topics in the same analysis.
    - Including a review of key topics towards the end of the program (e. g. in the CAPSTONE course) that includes an application exercise that requires a review and understanding of all the topics included within the program.

Interpreting and Using the Exam Scores

Inbound Exam results are obtained from incoming students who have not yet completed their advance program of study. Cumulative Inbound Exam results are only used relative to the cumulative outbound results to directly measure academic learning. Individual student results from Inbound Exams (Individual Results Report) can be used to help guide, advise, and place a student within a program of study; however, individual results should generally not be used for academic grading purposes other than perhaps extra credit (or some other incentive) to complete the exam.

Outbound Exam results are a direct measure of academic learning since the students taking the Outbound Exams have completed or nearly completed the degree program.

Outbound Exam results, both cumulatively and individually, **DO NOT** correspond directly to a traditional academic grading scale. This is a nationally normed exam with an average degree of difficulty of approximately 55%-60%. The exam is relative to only to the inbound results as well as the external aggregate comparisons.

There is a distinct difference between evaluating results versus grading individual exams. Individual student grading of Outbound Exams should be conducted using the table shown below on a relative grading scale (school officials determine the exact letter/point grades). Evaluation of the results for internal and external benchmarking should be conducted based comparisons to aggregate pools and between the Inbound and Outbound Exam results.

NOTE: There is no such level as a “passing” or “acceptable” score based on the results of this nationally normed exam nor do accreditation organizations expect to see a passing or acceptable level. Rather, school officials determine what is passing/acceptable based on associated benchmarks.

To encourage students to do their best with the Outbound Exams, an incentive is usually needed. Exam incentives include a direct grade, grading for extra credit if the result is above a certain threshold, or credit for a future assignment/activity within a course. Some client schools also use top scores to determine prizes or gifts. Typically, simply grading the exam based on the following relative grading scale is the best approach to properly incentivize the exam.

Another useful way of evaluating scores of outbound exams is to review the mean completion times. Typically, for example, a 100-question exam should take the student about 60-90 minutes to complete. If exam completion times are below 30-45 minutes academic officials may consider further efforts to incentivize the exam in order to get the students to take the exam seriously and thus, improve results. Mean completion times are shown in many of the graphs and tables. Reports can be re-run to screen out exam results where the completion time is below a desired threshold.

The following table shows an approximate relationship between the exam results and relative student performance based upon competency level. **Note: This table should only be used for relative grading purposes of individual student exams. This table should not be used to evaluate exam results for program-level assessment, rather the evaluation of exam results should be based on scores and comparisons of scores with the benchmarks.**

Abandoned exams are not included in the data set for this report.

Exam Score	Relative Interpretation of Student Competency
80-100%	Very High
70-79%	High
60-69%	Above Average
40-59%	Average
30-39%	Below Average
20-29%	Low
0-19%	Very Low

If specific academic credit (grade and points) are to be awarded to students based on their exam results, the table to the left could be used to assign letter grades, extra credit, and/or course points, assuming that the exam is included within a course.

Glossary of Terms

Abandoned Exam. An exam that had the 48 hour time limit elapse. These exams are auto-completed, giving the student a score of "0" for each unanswered question. These exams are only included in the school's individual results, not in the reporting or analysis.

Academic Level. The academic degree level of the program: associate, bachelors, masters, and doctoral.

Aggregate Pools. The aggregate pool is the data set used for external benchmarking and comparisons and is based on the results from accredited institutions. The various aggregate pools are defined as follows:

Pools Based on Program Delivery Modality

1. **Traditional**. The majority of the program is delivered at a campus location at an established college or university. The majority of the students are recent high school graduates, typically 18-22 years old. Courses are taught on a semester or quarter basis, typically Monday through Friday.
2. **Online**. The majority of the program is delivered online to students and there is little, if any, requirement for the students to go to a campus location any time during their college or university experience. The majority of the students are considered non-traditional, meaning they tend to be older, may have some college credit prior to starting their program, and are often working adults completing their degree program.
3. **Blended**. The program is delivered to students using a combination of online and campus-based instruction and/or the program is delivered in an accelerated format. The course term is typically 4 to 8 weeks. Campus-based instruction tends to be either at night or on weekends with generally longer sessions. The student population tends to be non-traditional, meaning they tend to be older, may have some college credit prior to starting their program, and are often working adults completing their degree program.

Pools Based on Location

1. **Outside-US**. Includes colleges and universities outside of the United States. Program delivery is usually campus-based; however, the aggregate pool includes some blended programs and online programs.
2. **Regional/Country**. Includes colleges and universities outside of the United States from specific regions (e.g. Latin America, Europe, Asia, etc.) or from specific countries (e.g. Mongolia). Program delivery is primarily campus-based; however, the pools may include some blended and online course delivery.
3. **Inside the US**. Includes all US-based schools and programs.

Pools Based on Institute Characteristics

1. **Large Private**. This aggregate pool includes large, privately owned universities within the United States.
2. **HBCU**. Includes colleges and university that are designated as Historically Black Colleges and Universities.
3. **Private**. US schools that are privately owned.
4. **Public**. US schools that are publicly owned.
5. **Faith-based**. US schools that have a specific religious affiliation or association.

Masters-level Pools Based on Degree Type

1. **Masters-MBA**. Includes programs that are designed as Masters of Business Administration.
2. **Masters-MS**. Includes programs that are designed as Masters of Science.
3. **Masters-MA**. Includes programs that are designed as Masters of Arts.
4. **Masters-MHA** . Includes all assessments under the Health Care Administration.
5. **Masters-MPA**. Includes all assessments under Public Administration.

Pools Based on Dual-Accreditation Affiliation

1. **IACBE**. Includes business schools and programs affiliated with the International Assembly for Collegiate Business Education. Where available, this pool is further divided by IACBE Region.
2. **ACBSP**. Includes business schools and programs affiliated with the Accreditation Council of Business Schools and Programs. Where available, this pool is further divided by ACBSP Region.
3. **AACSB**. Includes business schools and programs accredited with the Association to Advance Collegiate Schools of Business.

Assessment Period. The date range for the report, which includes all the exams administered within these dates. For synchronous schools, the assessment period is generally based upon the semester or quarter. For asynchronous schools, the assessment period is generally annual, semi-annual, or quarterly. School officials determine the assessment period.

Coefficient of Determination (R2) denoted R2 and pronounced R squared, is a statistical measure of how well the regression line approximates the real data points. An R2 of 1 indicates that the regression line perfectly fits the data.

Cohort. A group of students based upon a demographic factor such as specialization, campus location, program start date, etc. We provide cohort-level analysis based upon cohort categories identified at the start of the exam cycle.

Exam. Includes all of the topics to be assessed for a specified program. Each topic has 10 questions included within exam, randomly selected from a validated test bank that includes 300-500 exam questions. Inbound and Outbound Exams are generated from the same test bank of questions.

External Benchmarking. Analyses performed by comparing the cumulative results from a school with a demographically similar aggregate data set.

Frequency of Questions Correct. For Outbound Exams, the frequency of questions correct is calculated for each subject within a topic. The formula is: (Number of Questions Correct / Number of Questions Offered) * 100. In order to provide a relative index for understanding these data, an average of questions correct is shown for the aggregate pool selected for the Internal Analysis Report. To see the comparisons for other pools, the Internal Analysis Report can be re-run with a different pool selected.

Inbound Exam. A student exam administered early in the student's program, usually during their first or second core course, that measures the student's knowledge level at the beginning of their academic program.

Internal Benchmarking. Analyses performed by comparing the inbound and outbound exam scores and/or by the analyses of the frequency of questions correct for each subject within a topic.

Mean Completion Time. The average time, in minutes, to complete the exam. Mean completion time is also shown for each topic. Mean completion times are helpful when evaluating student effort, particularly with Outbound Exam results. If the Outbound Exams have a relatively low mean completion time, this may be an indication that the students are not putting forth their best effort. Additional incentives may be necessary to encourage better student performance (extra credit, points, letter grades, credit for future assignments, etc.).

Outbound Exam. A student exam administered at the end of the student's academic program, usually within their last course, that measures the student's knowledge level at the end of their academic program.

Percentage Change. The percentage change between two scores. For inbound/outbound testing, the percentage change is calculated using the following formula: *(Outbound Score / Inbound Score) - 1*.

Percentage Difference. The percentage difference between a school's outbound student results and the aggregate, calculated using the following formula: *Aggregate Score – School Score.*

Percentile. Percentiles are shown within the subject level analysis based upon the frequency of questions answered correctly. The measure is used to establish relevancy of the school's score with the selected aggregate pool used for the Internal Analysis Report. The percentile benchmarks indicate to what level an average score is needed in order to be at the 80th, 85th, 90th, or 95th percentile, which school officials can subsequently use for academic benchmarking and for setting performance targets.

1. A **percentile** rank is the percentage of scores that fall at or below a given score and is based on the following formula: ((NumValuesLessThanScore + (0.5 * NumValuesEqualScore)) / TotalNumValues) * 100. When shown, the percentile rank of the school's exam sample of the subject/subtopic/topic score to the aggregate pool is based on using exam results within the aggregate pool grouped by school and calculated using samples of 30 exams. The percentile rank is not a ranking based on the number of individual schools included within the aggregate pool, rather it is a percentile ranking compared to the exam results included within the aggregate pool.
2. The **percentile benchmark** values are calculated using the Empirical Distribution Function with Interpolation based upon the Excel Function of PERCENTILE.INC (array,k) with the following formula: (n-1)p=i+f where i is the integer part of (n-1)p, f is the fractional part of (n-1)p, n is the number of observation, and p is the percentile value divided by 100. The percentile benchmark then is the required score of questions correct to be at a specific percentile value (80th, 85th, 90th, or 95th) and is based on interpolation.

Percent Change Comparison. The percent difference between the school's percent change between Inbound and Outbound Exam results and the aggregate pool's percent change between Inbound and Outbound Exam results. The percent change comparison represents a relative learning difference between the specific school and demographically similar schools.

Scatter Plot. A visual representation of the exam results for all students. The purpose of the scatter plot is to provide you with a visual reference for the ranges in results.

Subjects. For each topic, questions are grouped using 4-8 subject areas. Subjects generally correspond to the school's learning outcomes associated with each topic. In using these data, consider the Subject is the Learning Outcome without the verb.

Subtopic. For the topics of Economics and Management, there are identified subtopics. For the topic of Economics, the subtopics are Macroeconomics and Microeconomics. For the topic of Management, the subtopics are Operations/Production Management, Human Resource Management, and Organizational Behavior. NOTE: When analyzing and evaluating the sub-topic scores, the cumulative totals of the subtopic scores (percentages) will not equal the topic score. The subtopic scores are based on the number of questions answered correctly for that specific subtopic. For example, getting 2 out 3 questions correct for the subtopic of Human Resource Management is a score of 66.66%, 3 out of 4 correct on Organization Behavior is 75% and 1 out of 3 on Operations/Production Management is 33.33%. The total Management topic score, however, is 2+3+1 = 6 out of 10, or 60%.

Summary Statistics. Includes the mean completion time, sample size, average score, standard deviation, and the min/max/median/mode scores.

Total Exam Score Significance. If a student simply randomly selected responses to questions, the statistical mean of the total score of such a randomly responded to exam would be approximately 30% (+/- 2.5% depending upon the number of questions on the exam). Therefore, exam scores above 30% could be considered significant in terms of measuring actual knowledge levels.

<u>Understanding and Using the Report</u>

The formulas used for percentile calculations are shown within the glossary of terms. Two statistical artifacts could appear on your reports where the percentile rank seems "off" when compared to the calculated values for the percentile benchmarks.

1. **Statistical Artifact #1:** Due to the use of different formulas used to calculate the school's percentile rank and the required scores for specific benchmarks, the school's rank is less than or higher than the required score for a percentile benchmark, usually by a factor of 1 percentile value. When calculating the percentile rank, we use the school's score and simply calculate the percent of scores that are at or below that score. When we calculate the percentile benchmark, we use an interpolation function to determine the required score for a specific percentile. Therefore, we use two different formulas for the percentile values: the first concerns the score and how many at/equal to the given score and the second an interpolation to calculate the desired score. Both use the same distribution list of scores, arranged in sequence from low to high. When we developed the distribution tables, we used 5 decimal points. When we calculated the benchmarks, we also calculated to 5 decimal points. We show, however, two decimal points in the table.
2. **Statistical Artifact #2:** Due to sample size limitations and rounding, the school's rank is less than the required score for a higher percentile benchmark. The lower the number of exams in the pool, the more these situations will occur. For example: the school score is 56.52% and the 85th percentile is 56.52. In this case, both calculations are correct; the issue concerns sample size. With only 586 questions offered in the pool, we have a distribution sample of 15 values. When we do the rank calculation (the 81st), it comes out "low" due to the sample size and the values within the distribution. When we do the calculations of the benchmarks (interpolation), the actual 85th benchmark to 5 decimal places is 56.52377, but rounds to 56.52 in the table. The school's score of 56.52 and the full number is 56.52173 (52/92 correct). The school's value is below the benchmark of 56.52% for the 85th Percentile, but due to rounding, it looks like the school's score should be at the 85th percentile.