**25th percentile**
The score at or below which 25 percent of students submitting test scores to an institution scored. *IPEDS*

**75th percentile**
The score above which 25 percent of students submitting test scores to an institution scored. *IPEDS*

**Analysis of Variance (ANOVA)**
A collection of statistical models, and their associated procedures, in which the observed variance in a particular variable is partitioned into components attributable to different sources of variation. In its simplest form ANOVA provides a statistical test of whether or not the means of several groups are all equal. ANOVAs are useful in comparing two, three, or more means.

**Average**
A measure of central tendency for continuous variables calculated as the sum of all scores in a distribution divided by the number of scores; the arithmetic average

**Baseline**
A point of reference for a unit of measurement. Baseline measures are frequently taken before an intervention is introduced or at a particular point in time; they are then compared with one or more measurements taken after the intervention is introduced or at subsequent points in time.

**Benchmark**
A criterion-referenced objective performance datum that is used for comparative purposes. A program can use its own data as a baseline benchmark against which to compare future performance. It can also use data from another program as a benchmark. In the latter case, the other program often is chosen because it is exemplary and its data are used as a target to strive for, rather than as a baseline.

**Bias**
A term which refers to how far the average statistic lies from the parameter it is estimating; that is, the error which arises when estimating a quantity. Errors from chance will cancel each other out in the long run; those from bias will not.

**Categorical Data**
A set of data is said to be categorical if the values or observations belonging to it can be sorted into mutually exclusive groups. For example, people have the characteristic of 'gender' with categories 'male' and 'female'.

**Ceiling Effect**
A statistical phenomenon whereby a measure has little to no chance of increasing because it is already at the high end of the score distribution when a baseline measurement is taken.

**Chi-Square Analysis**
An inferential statistical procedure for testing whether the frequencies of category membership in a sample represent the predicted frequencies in the population.

**Confidence Interval**
A confidence interval gives an estimated range of values which is likely to include an unknown population parameter, the estimated range being calculated from a given set of sample data. If independent samples are taken repeatedly from the same population, and a confidence interval calculated for each sample, then a certain
percentage (confidence level) of the intervals will include the unknown population parameter. Confidence intervals are usually calculated so that this percentage is 95%, but other confidence intervals can be calculated.

**Continuous Data**
Data is said to be continuous if the values/observations belonging to it may take on any value within a finite or infinite interval. You can count, order and measure continuous data. Examples are height, weight, and temperature.

**Correlation**
A measure of the statistical relationship, or association, between two variables. Correlations can range in value from 0.0 to 1.0 and can either be positive or negative. The absolute value of the correlation indicates its’ strength, with correlations closer to 1.0 (or -1.0) indicating a stronger relationship between the variables. The sign of the correlation indicates its direction. Positive correlations indicate that as the value of one variable goes up, so does the value of the other variable (e.g., as placement test scores increase, so do first-term GPAs). Negative correlations indicate that as the value of one variable goes up, the other goes down (e.g., the more times that students repeat courses, the lower their GPA). Correlations are considered small if they range in value from (+/-) .10 to (+/-) .30, medium if they range from (+/-) .30 to (+/-) .50, and large if they range from (+/-) .50 to (+/-) 1.0.

**Correlational Analysis**
A study in which students’ scores on two or more variables are measured, without manipulation of any variables, to determine if and how much of an association there is among the variables. Correlational studies can be used to infer associations between variables, but not causal effects of one variable on another.

**Cross-Tabulation**
A type of table in a matrix format that displays the (multivariate) frequency distribution of the variables.

**Cumulative Frequency**
For a given score or outcome of a variable, the total number of cases in a distribution at or below that value.

**Cumulative Frequency Distribution**
A distribution of scores showing the number of cases at or below each outcome of the variable being displayed in the distribution.

**Cumulative Percentage**
For a given score or outcome of a variable, the percentage of cases in a distribution at or below the value.

**Cumulative Percentage Distribution**
A distribution of scores showing the percentage of cases at or below each outcome of the variable being displayed in the distribution.

**Data Dictionary**
A file or a list that contains all known information about variables such as format, data type, field width, definition, and source.

**Data Year**
The year to which data pertain in a particular IPEDS component. For example, for collection year 2003-04 tuition is for data year 2003-04, whereas completions are for data year 2002-03. **IPEDS**

**Deduction**
Process of deriving a conclusion about relationships among concepts by logical reasoning about their connections to common concepts.
Dependent Variable
A variable that is measured in a statistical analysis and that has a consequent, or affected, role in relation to the independent variable(s).

Descriptive Statistics
Numbers that describe features of a set of observations; examples are percentages, modes, variances, and correlations.

Direct Measure
Measures of student learning that require students to display their knowledge and skills as they respond to the instrument itself. Objective tests, essays, presentations, and classroom assignments all meet this criterion.

Discrete Variable
A variable that classifies persons, objects, or events according to the kind or quality of their attributes.

Effect Size
In statistics, an effect size is a measure of the strength of the relationship between two variables in a statistical population, or a sample-based estimate of that quantity. An effect size calculated from data is a descriptive statistic that conveys the estimated magnitude of a relationship without making any statement about whether the apparent relationship in the data reflects a reliable relationship in the population, or is statistically significant.

Exclusions
Those students who may be removed (deleted) from a cohort (or subcohort).

Experiment
A research method in which one or more independent variables is manipulated within a controlled environment in order to determine effects on one or more dependent, or outcome, variables. Carefully-controlled experiments permit the inference of cause-effect relationships between variables.

Floor Effect
A statistical phenomenon whereby a measure has little to no chance of decreasing because it is already at the low end of the score distribution when a baseline measurement is taken.

Frequency
The number of cases in a given outcome of a variable.

Frequency Distribution
A table of the outcomes of a variable and the number of times each outcome is observed in a sample.

Imputation
A method of estimating data for missing values.

Independent Variable
A variable that has an antecedent, or causal, role in relation to the outcome variable being measured (the dependent variable)

Indicators
A regularly produced measure that describes a specified condition or result that a college can gather information on, examine and report on, and use regularly and systematically as a tool for planning, assessment, and decision making.
**Indirect Measures**
Measures such as surveys and interviews that ask students to reflect on their learning rather than to demonstrate it.

**Inference**
The process of making generalizations or drawing conclusions about the attributes of a population from evidence contained in a sample.

**Inferential Statistics**
Numbers that represent generalizations, or inferences, drawn about some characteristic of a population, based on evidence from a sample of observations from the population.

**Interval Scale**
An interval scale is a scale of measurement where the distance between any two adjacent units of measurement (or 'intervals') is the same but the zero point is arbitrary. Scores on an interval scale can be added and subtracted but cannot be meaningfully multiplied or divided. For example, the time interval between the starts of years 1981 and 1982 is the same as that between 1983 and 1984, namely 365 days. The zero point, year 1 AD, is arbitrary; time did not begin then.

**Interval Level of Measurement**
Scale that assigns numbers to observations that reflect a constant unit of length between categories.

**Least Squares**
The sum of squared deviations of a set of scores about the mean that is a minimum.

**Linear Regression**
In statistics, linear regression is an approach for modeling the relationship between a scalar dependent variable \( y \) and one or more explanatory variables (or independent variables) denoted \( X \).

**Logistic Regression**
A widely-used multivariate statistical technique that is used to predict a dichotomous outcome, or dependent, variable (e.g., retained vs. not retained) based on multiple predictor, or independent, variables (e.g., overall GPA, grades, test scores, etc.).

**Longitudinal**
Data collected on the same individuals over time for use in a longitudinal study. A study that investigates development, learning, or other types of change in individuals over time.

**Margin of Error**
The margin of error is a statistic that reflects the amount of sampling error in a survey’s results and is based on the size of the sample in relation to the size of the population. It can be used to estimate the percentage of individuals who would respond to a survey question in a particular way if the full population had actually been surveyed. For example, if 50% of respondents say that they are satisfied with a particular experience and the survey has a 2% margin of error, then the estimated percentage of individuals in the full population who would say that they are satisfied can be estimated at between 48% and 52%. The lower the margin of error, the more confidence one can have that the data are representative of the full population. Ideally, the margin of error should be 5% or less.
Mean
A measure of central tendency for continuous variables calculated as the sum of all scores in a distribution divided by the number of scores; the arithmetic average.

Measurement
The systematic investigation of attributes, behaviors, events, phenomenon, or objects.

Median
The value or score that exactly divides an ordered frequency distribution into equal halves; the outcome associated with the 50th percentile.

Midpoint
A number exactly half way between the true upper and lower limits of a measurement class or interval, obtained by adding the upper to the lower limits and dividing by 2.

Migration (of Data)
Refers to the movement of data from one location to another location (in databases) or from one format to another format.

Mode
The value of the response category in a frequency distribution that has the largest number or percentage of cases.

Multiple Regression Analysis
A statistical technique for estimating the relationship between a continuous dependent variable and two or more continuous or discrete independent variables.

Negative Skew
A property of frequency distribution in which the larger frequencies are found toward the positive end of the diagram and the smaller frequencies toward the negative end.

Nominal Data
A set of data is said to be nominal if the values/observations belonging to it can be assigned a code in the form of a number where the numbers are simply labels. You can count but not order or measure nominal data. For example, in a data set males could be coded as 0, females as 1; marital status of an individual could be coded as Y if married, N if single.

Nominal Level of Measurement
Scale that assigns a name or number to observations in a purely arbitrary sequence.

Norm
An interpretation of scores on a measure that focuses on the rank ordering of students - not their performance - in relation to criteria.

Normal Distribution
A distribution of scores in which most values are dispersed around the average, or mean and fewer scores fall to the extreme ends of the range. Normal distributions are symmetrical and have a bell-shaped appearance. Many inferential statistical tests assume/require that the underlying distribution of scores is normally distributed.
Null Hypothesis
A statistical prediction that of no difference or relationship between variables. Inferential statistics are designed to help researchers make a judgment based on a sample as to whether the null hypothesis should be rejected and accept an alternative hypothesis as providing a better estimate of a population.

Objective Test
A test with answers that have been deemed right or wrong in a way that is free from the judgment of the individual who is scoring the test.

Operational Definition
A statement that defines a term, variable, or set of processes with respect to a specific set of criteria.

Ordinal Data
A set of data is said to be ordinal if the values / observations belonging to it can be ranked (put in order) or have a rating scale attached. You can count and order, but not measure, ordinal data.

Ordinal Level of Measurement
Scale that assigns numbers to observations in sequence, from lesser to greater amounts of the measured attribute.

Percentages
A number created by multiplying a proportion by 100.

Percentile
The outcome or score below which a given percentage of observations fall.

Population
All persons, objects, or events having at least one common attribute to which the researcher wishes to generalize on the basis of a representative sample of observations. Population size is denoted by $N$.

Positive Skew
An asymmetrical frequency distribution characteristic whereby, in a graphic display, larger frequencies are found toward the negative end of the diagram and the smaller frequencies toward the positive end.

Power (Statistical)
The probability that a statistical test will detect an effect if one exists in the population.

Practical Significance
The importance of a research finding for theory, policy, or explanation, apart from its statistical significance.

Probability
A mathematical statement indicating the likelihood that an event will occur when a particular population is randomly sampled.

Qualitative
Data in which the values of a variable differ in kind (quality) rather than in amount.

Quantitative
Data in which the values of a variable differ in amount rather than in kind.
Random Sample
A sample whose cases or elements are selected at random (in a non-systematic way) from a population.

Range
The difference between the lowest and highest values in a set of data.

Ratio Level of Measurement
Scale that assigns numbers to the observations to reflect the experience of a true, or absolute, zero point.

Regression to the Mean
A phenomenon in which a variable that is extreme on its first measurement will tend to be closer to the center of the distribution on a later measurement by chance alone.

Relative Frequency (Proportion)
A number formed by dividing the cases associated with an outcome of a variable by the total number of cases.

Reliability
The degree to which different operations of the same concept yield the same results.

Representativeness
The degree to which characteristics of a sample accurately stand for the population from which the observations were selected.

Response Rate
The ratio of the number of people who answered the survey divided by the number of people in the sample.

Rubric
A scoring tool that lists the criteria for a piece of work, or "what counts" (for example, purpose, organization, and mechanics are often what count in a piece of writing); it also articulates gradations of quality for each criterion, from excellent to poor.

Sample
A subset of cases or elements selected from a population.

Sample Size
The number of cases or observations selected from a population for a specific sample. It is typically denoted n, a positive integer.

Skewed Distribution
A frequency distribution that is asymmetric with regard to its dispersion. See positive skew and negative skew.

Standard Deviation
A statistic that reflects the average of the deviations of the scores from the mean in a set of data. In a normal distribution, 68% of the scores fall within one standard deviation of the mean, 95% fall within two standard deviations, and 98% fall within three. Scores within one standard deviation of the mean are typically considered to be within the normal range.

Standardized Test
A test that is administered and scored in a consistent, or "standard", manner. They are designed such that the questions, conditions for administering, scoring procedures, and interpretations are consistent.
**Statistical Significance**
Significance of a relationship in a statistical sense, as indicated by rejection of a null hypothesis at a particular probability level or p-value (typically .05). Because results can be due to a large sample size, statistical significance does not necessarily reveal practical importance.

**Statistical Significance Test**
A test of inference that conclusions are based on a sample of observations also hold true for the population from which the sample was selected.

**Subjective Test**
A test where the examiner evaluates the answers according to their own judgment (as opposed to an objective test).

**Summative (Assessment)**
The goal of summative assessment is to evaluate student learning at the end of an instructional unit by comparing it against some standard or benchmark.

**T-Test**
An inferential statistical procedure to evaluate differences between two continuous variables.

**Unduplicated Count**
The sum of students enrolled for credit, with each student counted only once during the reporting period, regardless of when the student enrolled. *IPEDS*

**Under-Represented**
A term describing a particular subpopulation that has a lower percentage representation than one would expect when compared to the proportion that the subpopulation represents in the whole population. Subpopulations could include: students with disabilities, students from disadvantaged backgrounds, particular racial or ethnic groups, or a particular gender.

**Validity**
The degree to which an instrument accurately measures the concept it is intended to measure.

**Variable**
A characteristic or attribute of persons, objects, or events that differs in value across such persons, objects, or events; a fundamental unit of data contained in a file which is given a unique label.

**Variation**
The spread or dispersion of a set of scores around some central value.