

**Data Definitions**  
Adapted from the Glossary  
How to Design and Evaluate Research in Education  
by  
Jack R. Fraenkel and Norman E. Wallen,

**A**

**A-B design** —A single-subject experimental design in which measurements are repeatedly made until stability is presumably established (baseline), after which treatment is introduced and an appropriate number of measurements are made.

**A-B-A design** —Same as the A-B design except a second baseline is added.

**A-B-A-B design** —A single-subject experimental design in which measurements are repeatedly made until stability is presumably established (baseline), after which treatment is introduced and an appropriate number of measurements are made; the treatment phase is followed by a second baseline phase, which is followed by a second treatment phase.

**accessible population** —The population from which the researcher can realistically select subjects for a sample, and to which the researcher is entitled to generalize findings.

**achievement test** —An instrument used to measure the proficiency level of individuals in given areas of knowledge or skill.

**age-equivalent score** —A score that indicates the age level for which a particular performance (score) is typical.

**B**

**B-A-B design** —A treatment followed by a baseline followed by a return to the treatment.

**baseline** —The graphic record of measurements taken prior to introduction of an intervention in a time-series design.

**C**

**case study** —An in-depth investigation of an individual, group, or institution to determine the variables, and relationship among the variables, influencing the current behavior or status of the subject of the study.

**categorical data variables** —Data (variables) that differ only in kind, not in amount or degree.

**causal-comparative research** —Research that attempts to determine the cause for, or consequences of, existing differences in groups of individuals; also referred to as ex post facto research.

**cluster sampling   cluster random sampling** —The selection of groups of individuals, called clusters, rather than single individuals; all individuals in a cluster are included in the sample; the clusters are preferably selected randomly from the larger population of clusters.

**comparison group** —The group in a research study that receives a different treatment from that of the experimental group.

**concurrent validity (evidence of)** —The degree to which the scores on an instrument are related to the scores on another instrument administered at the same time, or to some other criterion available at the same time.

**confidence interval** —An interval used to estimate a population value. It is constructed in such a way that the interval has a predetermined probability of including the value.

**constant** —A characteristic that has the same value for all individuals.

**constitutive definition** —Explanation of the meaning of a term by using other words to describe concisely what is meant.

**construct-related validity (evidence of)** —The degree to which an instrument measures an intended hypothetical psychological construct, or nonobservable trait.

**content analysis** —The process of inductively establishing a categorical system for organizing open-ended information.

**content-related validity (evidence of)** —The degree to which an instrument logically appears to measure an intended variable, as determined by expert judgment.

**control group** —The group in a research study that is treated “as usual.”

**convenience sample** —A sample that is easily accessible.

**correlational research** —Research that involves collecting data in order to determine the degree to which a relationship exists between two or more variables.

**counterbalanced design** —An experimental design in which all groups receive all treatments. Each group receives the treatments in a different order, and all groups are posttested after each treatment.

**criterion-related validity (evidence of)** —The degree to which performance on an instrument is related to performance on other instruments intended to measure the same variable, or to other variables logically related to the variable being measured.

## D

**data** —Any information obtained about a sample.

**data collector bias** —Unintentional behaviors or expectations on the part of data collectors that may create a threat to the internal validity of a study.

**dependent variable** —A variable affected or expected to be affected by the independent variable; also called criterion or outcome variable.

**derived score** —A score obtained from a raw score in order to aid in interpretation. Derived scores provide a quantitative measure of each subject's performance relative to a comparison group.

**descriptive research study** —Research that attempts to describe existing conditions without analyzing relationships among variables.

**descriptive statistics** —Data analysis techniques enabling the researcher to meaningfully describe data with numerical indices or in graphic form.

**descriptors** —Terms used to locate sources during a computer search of the literature.

**directional hypothesis** —A relational hypothesis stated in such a manner that a direction, often indicated by “greater than” or “less than,” is hypothesized for the results.

**discussion (of a study)** —A review of the results including limitations of a study, placing the findings in a broader perspective.

## E

**ecological generalizability** —The degree to which results can be generalized to environments and conditions outside the research setting.

**effect size** —An index used to indicate the magnitude of an obtained result or relationship.

**empirical** —Based on observable evidence.

**equivalent forms** —Two tests identical in every way except for the actual items included.

**equivalent-forms method** —A way of checking consistency by correlating scores on equivalent forms of an instrument in order to obtain a reliability coefficient; also referred to as alternate-forms reliability.

**errors of measurement** —Inconsistency of individual scores on the same instrument.

**ethnography   ethnographic research** —The collection of data on many variables over an extended period of time in a naturalistic setting, usually using observation and interviews.

**experiment** —A research study in which one or more independent variables are systematically varied by the researcher to determine the effects of this variation.

**experimental group** —The group in a research study that receives the treatment (or method) of special interest in the study.

**experimental research** —Research in which at least one independent variable is manipulated, other relevant variables are controlled, and the effect on one or more dependent variables is observed.

**experimental variable** —The variable that is manipulated (systematically altered) in an intervention study by the researcher.

**external validity** —The degree to which results are generalizable, or applicable, to groups and environments outside the research setting.

**extraneous event** —An event that is not part of an intervention but that may affect performance on the dependent variable, thereby influencing results and affecting internal validity; also referred to as a history threat to internal validity.

**extraneous variable** —A variable that makes possible an alternative explanation of results; an uncontrolled independent variable.

## **F**

**factorial design** —An experimental design that involves two or more independent variables (at least one of which is manipulated) in order to study the effects of the variables individually, and in interaction with each other, upon a dependent variable.

**frequency polygon** —A graphic method of showing all the scores obtained by a group of individuals.

**field diary** —A personal statement of a researcher's opinions about people and events he or she comes in contact with during research.

**field jottings** —Quick notes taken by an ethnographer.

**field log** —A running account of how an ethnographer plans to, and actually does, spend his or her time in the field.

**field notes** —The notes researchers take about what they observe and think about in the field.

## G

**general references** —Sources that researchers use to identify more specific references (e.g., indexes, abstracts).

**generalizing** —See ecological generalizability; population generalizability.

**grade-equivalent score** —A score that indicates the grade level for which a particular performance (score) is typical.

## H

**Hawthorne effect** —A positive effect of an intervention resulting from the subjects' knowledge that they are involved in a study, or their feeling that they are in some way receiving special attention.

**hypothesis** —A tentative, reasonable, testable assertion regarding the occurrence of certain behaviors, phenomena, or events; a prediction of study outcomes.

## I

**implementation threat** —The possibility that results are due to variations in the implementation of the treatment in an intervention study, thereby affecting internal validity.

**independent variable** —A variable that affects (or is presumed to affect) the dependent variable under study and is included in the research design so that its effect can be determined; sometimes called the experimental or treatment variable.

**inferential statistics** —Data analysis techniques for determining how likely it is that results based on a sample or samples are similar to results that would have been obtained for an entire population.

**informal interviews** —Less-structured forms of interview, usually conducted by qualitative researchers. They do not involve any specific type or sequence of questioning, but resemble more the give and take of a casual conversation.

**instrument** —Any procedure or device for systematically collecting data.

**instrument decay** —Changes in instrumentation over time that may affect the internal validity of a study.

**instrumentation** —The entire process of collecting data in a study.

**interaction** —An effect created by unique combinations of two or more independent variables; systematically evaluated in a factorial design.

**interjudge reliability** —The consistency of two (or more) independent scorers, raters, or observers.

**internal validity** —The degree to which observed differences on the dependent variable are directly related to the independent variable, not some other (uncontrolled) variable.

**intervention** —A specified treatment or method that is intended to modify one or more dependent variables.

**interview** —A form of research in which individuals are questioned orally.

## **J**

**justification (of a study)** —A rationale statement in which a researcher indicates why the study is important to conduct; includes implications for theory and or practice.

## **K**

**key informants** —Individuals identified as expert sources of information, especially in qualitative research.

**Kuder-Richardson approaches** —Procedures for estimating the internal consistency reliability of a test or other instrument from a single administration of the test without splitting the test into halves.

## **L**

**level of confidence** —The probability associated with a confidence interval; the probability that the interval will contain the population value. Commonly used confidence levels in educational research are 95 and 99 percent.

**level of significance** —The probability that a discrepancy between a sample statistic and a specified population parameter is due to sampling error, or chance. Commonly used significance levels in educational research are .05 and .01.

**literature review** —The systematic identification, location, and analysis of documents containing information related to a research problem.

**location threat** —The possibility that results are due to characteristics of the setting or location in which a study is conducted, thereby producing a threat to internal validity.

**longitudinal survey** —A study in which information is collected at different points in time in order to study changes over time (usually of considerable length, such as several months or years).

**loss-of-subjects threat** —The possibility that subjects who are “lost” to a study (for whatever reason) may differ from those who remain so that their absence has a significant effect on the results of the study. Also referred to as mortality.

## M

**matching design** —A technique for equating groups on one or more variables so that each member of one group has a direct counterpart in another group.

**maturation threat** —The possibility that changes that occur in subjects as a direct result of the passage of time affect the dependent variable and thereby affect internal validity.

**measured variable** —Data that differ in amount or degree, along a continuum from less to more.

**mechanical matching** —A process of pairing two persons whose scores on a particular variable are similar.

**multiple-baseline design** —A single-subject experimental design in which baseline data are collected on several behaviors for one subject, after which the treatment is applied over a period of time to each behavior in sequence until all behaviors are under treatment.

## N

**naturalistic observation** —Observation in which the observer controls or manipulates nothing, and tries not to affect the observed situation in any way.

**nondirectional hypothesis** —A prediction that a relationship exists without specifying its exact nature.

**nonequivalent control group design** —An experimental design involving at least two groups, both of which may be pretested; one group receives the experimental treatment, and both groups are posttested. Individuals are not randomly assigned to treatments.

**nonparticipant observation** —Observation in which the observer is not directly involved in the situation to be observed.

**normal distribution** —A theoretical “bell-shaped” distribution having a wide application to both descriptive and inferential statistics. It is known or thought to portray many human characteristics in “typical” populations.

**null hypothesis** —A statement that any difference between an obtained sample statistic and a specified population value is due to sampling error, or chance.

## O

**observer bias** —The possibility that an observer does not observe objectively and accurately, thus producing invalid observations and a threat to the internal validity of a study.

**one-group pretest-posttest design** —A weak experimental design involving one group that is pretested, exposed to a treatment, and posttested.

**operational definition** —Explanation of the meaning of a term by stating the actions, processes, or operations used to measure or identify examples of it.

**outcome variable** —See dependent variable.

## P

**Panel study** -A longitudinal design (in survey research) in which the same random sample is measured at different points in time.

**Parameter**- A numerical index describing a characteristic of a population.

**Parametric technique**- A test of significance appropriate when the data represent an interval or ratio scale of measurement and other specific assumptions have been met.

**Partial correlation** -A method of controlling the subject characteristics threat in correlational research by statistically holding one or more variables constant.

**Participant observation**- Observation in which the observer actually becomes a participant in the situation to be observed.

**Participants** -Individuals whose involvement in a study can range from providing data to initiating and designing the study.

**Participatory action research**- Action research intended not only to address a local problem but also to empower individuals and to bring about social change.

**Path analysis** -A type of sophisticated analysis investigating causal connections among correlated variables.

**Pearson r** -An index of correlation appropriate when the data represent either interval or ratio scales; it takes into account each and every pair of scores and produces a coefficient between .00 and either + or – 1.00.



**Percentile rank** - An index of relative position indicating the percentage of scores that fall at or below a given score.

**Performance checklist**- Used to keep track of behaviors that occur.

**Performance test** -Measures an individual's performance on a particular task.

**Phenomenology phenomenological research**- A form of qualitative research in which the researcher attempts to identify commonalities in the perceptions of several individuals regarding a particular phenomenon.

**Pie chart**- A graphic method of displaying the breakdown of data into categories.

**Pilot study** -A small-scale study administered before conducting an actual study its purpose is to reveal defects in the research plan.

**Population** -The group to which the researcher would like the results of a study to be generalizable; it includes all individuals with certain specified characteristics.

**Population generalizability**- The extent to which the results obtained from a sample are generalizable to a larger group.

**Portraiture** -A form of qualitative research in which the researcher and the individual being portrayed work together to define meaning.

**Positively skewed distribution** -A distribution in which there are more extreme scores at the upper, or higher, end than at the lower end.

**Positivism** -A philosophic viewpoint emphasizing an 'objective' reality which includes universal laws governing all things including human behavior.

**Posttest-only control group design** -An experimental design involving at least two randomly formed groups; one group receives a treatment, and both groups are posttested.

**Power of a statistical test** -The probability that the null hypothesis will be rejected when there is a difference in the populations; the ability of a test to avoid a Type II error.

**Practical action research** -Action research intended to address a specific local problem.

**Practical significance** -A difference large enough to have some practical effect. Contrast with **statistical significance**, which may be so small as to have no practical consequences.

**Predicted score** - The score a researcher predicts that someone will obtain when measured on one variable after it is known what score the person obtained when measured on another variable.

**Prediction** -The estimation of scores on one variable from information about one or more other variables.

**Prediction equation** -A mathematical equation used in a prediction study.

**Prediction equation** -A mathematical equation used in a prediction study.

**Prediction studies** -Attempts to determine variables that are related to a criterion variable.

**Prediction study** -An attempt to determine variables that are related to a criterion variable.

**Predictive validity (evidence of)** -The degree to which scores on an instrument predict characteristics of individuals in a future situation.

**Predictor variable** -The variable from which projections are made in a prediction study.

**Predictor variable(s)** -The variable(s) from which projections are made in a prediction study.

**Pretest-posttest control group design** -An experimental design that involves at least two groups; both groups are pretested, one group receives a treatment, and both groups are posttested. For effective control of extraneous variables, the groups should be randomly formed.

**Pretest-treatment interaction** -The possibility that subjects may respond or react differently to a treatment because they have been pretested, thereby creating a threat to internal validity.

**Primary source** -Firsthand information such as the testimony of an eyewitness, an original document, a relic, or a description of a study written by the person who conducted it.

**Probability** -The relative frequency with which a particular event occurs among all events of interest.

**Problem statement** -A statement that indicates the specific purpose of the research, the variables of interest to the researcher, and any specific relationship between those variables that is to be, or was, investigated; includes description of background and rationale (justification) for the study.

**Procedures** -A detailed description by the researcher of what was (or will be) done in carrying out a study.

**Purpose (of a study)** -A specific statement by a researcher of what he or she intends to accomplish.

**Purposive sample** -A nonrandom sample selected because prior knowledge suggests it is representative, or because those selected have the needed information.

## Q

**Qualitative data** - Data that are not numerical.

**Qualitative research study** -Research in which the investigator attempts to study naturally occurring phenomena in all their complexity.

**Qualitative variable** -A variable that is conceptualized and analyzed as distinct categories, with no continuum implied.

**Quantitative data** -Data that differ in amount or degree, along a continuum from less to more.

**Quantitative research** -Research in which the investigator attempts to clarify phenomena through carefully designed and controlled data collection and analysis.

**Quantitative variable** -A variable that is conceptualized and analyzed as distinct categories, with no continuum implied.

**Quasi-experimental designs** -A type of experimental design in which the researcher does not use random assignment of subjects to groups.

**Questionnaire** -A list of questions that the participant answers in writing or by marking answers on an answer sheet.

## **R**

**Random assignment** -The process of assigning individuals or groups randomly to different treatment conditions.

**Random numbers, table of** -A table of numbers that provides one of the best means of random selection or random assignment.

**Random sample** -A sample selected in such a way that every member of the population has an equal chance of being selected.

**Random sampling** -Methods designed to select a representative sample by using chance selection so that biases will not systematically alter the sample.

**Random selection sampling** The process of selecting a random sample.

**Range** -The difference between the highest and lowest scores in a distribution; measure of variability.

**Rating scale** -The rating scale is an instrument on which a researcher or participant or observer can record a rating of a behavior, a product, or a performance.

**Ratio scale** -A measurement scale that, in addition to being an interval scale, also has an absolute zero in the scale.

**Raw score** -The score attained by an individual on the items on a test or other instrument.

**Reflective field notes** A record of the observer's thoughts and reflections during and after observation.

**Regressed gain score** -A score indicating amount of change that is determined by the correlation between scores on a posttest and a pretest (and or other scores). It provides more stable information than a simple posttest-pretest difference.

**Regression line** -The line of best fit for a set of scores plotted on coordinate axes (on a scatterplot).

**Regression threat** -The possibility that results are due to a tendency for groups, selected on the basis of extreme scores, to regress toward a more average score on subsequent measurements, regardless of the experimental treatment.

**Relationship** -A connection between two qualities or characteristics (e.g., motivation and learning).

**Relationship study** -A study investigating relationships among two or more variables, one of which may be a treatment (method) variable.

**Reliability** -The degree to which scores obtained with an instrument are consistent measures of whatever the instrument measures.

**Reliability coefficient**-An index of the consistency of scores on the same instrument. There are several methods of computing a reliability coefficient, depending on the type of consistency and characteristics of the instrument.

**Relics** -Any object that can provide some information about the past.

**Replication** -Refers to conducting a study again; the second study may be a repetition of the original study, using different subjects, or may change specified aspects of the study.

**Representativeness** -The extent to which a sample is identical (in all characteristics) to the intended population.

**Representative sample** -A sample that is like the population in terms of relevant characteristics.

**Research** -The formal, systematic application of scholarship, disciplined inquiry, and most often the scientific method to the study of problems.

**Research bias**- A threat to internal validity when observed differences on the dependent variable are not directly related to the independent variable, but some other (uncontrolled) variable.

**Researcher bias** A situation in which the researcher's hopes or expectations concerning the outcomes of the study actually contribute to producing various outcomes, thereby creating a threat to internal validity.

**Research design** -The overall plan for collecting data in order to answer the research question. Also the specific data analysis techniques or methods that the researcher intends to use.

**Research hypothesis** -A prediction of study outcomes. Often a statement of the expected relationship between two or more variables.

**Research problem** -A problem that someone would like to research; it is the focus of a research investigation.

**Research proposal** -A detailed description of a proposed study designed to investigate a given problem.

**Research question** -A question that we can answer by collecting and analyzing data.

**Research report** -A description of how a study was conducted, including results and conclusions.

**Results (of a study)** -A statement that explains what is shown by analysis of the data collected; includes tables and graphs when appropriate.

**Retrospective interview** -A form of interview in which the researcher tries to get a respondent to reconstruct past experiences.

## **S**

**Sample** -The group on which information is obtained.

**Sampling** - process of selecting a number of individuals (a sample) from a population, preferably in such a way that the individuals are representative of the larger group from which they were selected.

**Sampling distribution** -The theoretical distribution of all possible values of a statistic from all possible samples of a given size selected from a population.

**Sampling error** -Expected, chance variation in sample statistics that occurs when successive samples are selected for the sample in systematic sampling.

**Sampling interval** -The distance in a list between individuals chosen when sampling systematically.

**Scatterplot** -The plot of points determined by the cross-tabulation of scores on coordinate axes; used to represent and illustrate the relationship between two quantitative variables.

**Scientific method** -A way of knowing that is characterized by the public nature of its procedures and conclusions and by rigorous testing of conclusions.

**Secondary source** -Secondhand information, such as a description of historical events by someone not present when the event occurred.

**Self-checklist** -A list of characteristics or activities that the participants in a study reads and then checks to identify those characteristics that they possess or the activities that they have engaged in.

**Semistructured interview**-A structured interview, combined with open-ended questions.

**Sensory questions** -Questions asked by a researcher to find out what a person has seen, heard, or experienced through his or her senses.

**Short-answer items** -A type of supply item in which the respondent is required to supply a word, phrase, number, or symbol that is necessary to complete a statement or answer the question.

**Sign test** -A nonparametric inferential statistic used to compare two groups that are not independent.

**Simulation** -Research in which an "artificial" situation is created and participants are told what activities they are to engage in.

**Single-subject designs** -Designs applied when the sample size is one; used to study the behavior change that an individual exhibits as a result of some intervention or treatment.

**Single-subject research** -Research that focuses on individual study participants, rather than groups.

**Skewed distribution** -A nonsymmetrical distribution in which there are more extreme scores at one end of the distribution than the other.

-

**Snowball sample** -In qualitative research, a sample selected as the need arises during a study.

**Split-half procedure** -A method of estimating the internal-consistency reliability of an instrument; it is obtained by giving an instrument once but scoring it twice – for each of two equivalent "half tests." These scores are then correlated.

**Stability** -The extent to which scores are reliable (consistent) over time.

**Standard deviation (SD)** -The most stable measure of variability; it takes into account each and every score in a distribution

**Standard error of a statistic** -The standard deviation of the sampling distribution of a statistic.

**Standard error of estimate**-An estimate of the size of the error to be expected in predicting a criterion score.

**Standard error of measurement (SEMeas)** -An estimate of the size of the error that one can expect in an individual's score.

**Standard error of the difference (SED)** -The most stable measure of variability; it takes into account each and every score in a distribution..

**Standard error of the mean (SEM)** -The standard deviation of sample means that indicates by how much the sample means can be expected to differ if other samples from the same population are used.

**Standard score** -A derived score that expresses how far a given raw score is from the mean, in terms of standard deviation units.

**Static-group comparison design** -A weak experimental design that involves at least two nonequivalent groups; one receives a treatment and both are posttested.

**Static-group pretest-posttest design** -The same as the static-group comparison design, except that both groups are pretested.

**Statistic** -A numerical index describing a characteristic of a sample.

**Statistically significant**-The conclusion that results are unlikely to have occurred due to sampling error or "chance;" an observed correlation or difference probably exists in the population.

**Statistical matching** -A means of equating groups using statistical prediction.

**Statistics** -A numerical index describing a characteristic of a sample.

**Stratified random sampling**-The process of selecting a sample in such a way that identified subgroups in the population are represented in the sample in the same proportion as they exist in the population.

**Structured interview**-A formal type of interview, in which the researcher asks, in order, a set of predetermined questions.

**Subject characteristics threat** -The possibility that characteristics of the subjects in a study may account for observed relationships, thereby producing a threat to internal validity.

**Subjects** -Individuals whose participation in a study is limited to providing information.



**Survey** -A method of collecting information by asking a sample of participants questions in order to find out information about a population.

**Survey study research** -An attempt to obtain data from members of a population (or a sample) to determine the current status of that population with respect to one or more variables.

**Systematic sampling** -A selection procedure in which all sample elements are determined after the selection of the first element, since each element on a selected list is separated from the first element by a multiple of the selection interval.

## **T**

**Table of random numbers** -A table of numbers that provides one of the best means of random selection or random assignment.

**Tally sheet** -A device used by researchers to report the frequency of student behaviors, activities, or remarks.

**Target population** -The population to which the researcher, ideally, would like to generalize results.

**Testing threat** -A threat to internal validity that refers to improved scores on a posttest that are a result of subjects having taken a pretest.

**Test of significance** -A statistical test used to determine whether or not the obtained results for a sample are likely to represent the population.

**Test-retest method** -A procedure for determining the extent to which scores from an instrument are reliable over time by correlating the scores from two administrations of the same instrument to the same individuals.

**Theme** -A means of organizing and interpreting data in a content analysis by grouping codes as the interpretation progresses.

**Theoretical sample** -In qualitative research, a sample that helps the researcher understand or formulate a concept or interpretation.

**Thick description** - ethnography, the provision of great detail on the basic data information.

**Thick description** -In ethnography, the provision of great detail on the basic data information.

**Time-and-motion logs** -Reporting of what is observed and the time it is observed.

**Time-series design** -An experimental design involving one group that is repeatedly pretested, exposed to an experimental treatment, and repeatedly posttested.

**Trend study** -A longitudinal design (in survey research) in which the same population (conceptually but not literally) is studied over time by taking different random samples.

**Triangulation** -Cross-checking of data using multiple data sources or multiple data-collection procedures.

**Triangulation mixed method design** -A study in which quantitative and qualitative data are collected simultaneously and used to validate and clarify findings.

**True-false item**-A statement that is either true or false and the respondent must indicate which it is.

**T score** -A standard score derived from a z score by multiplying the z score by 10 and adding 50.

**t-test for correlated means** -A parametric test of **statistical significance** used to determine whether there is a statistically significant difference between the means of two matched, or nonindependent, samples. It is also used for pre-post comparisons.

**t-test for correlated proportions** -A parametric test of **statistical significance** used to determine whether there is a statistically significant difference between two proportions based on the same sample or otherwise non-independent groups.

**t-test for independent means** A parametric test of significance used to determine whether there is a statistically significant difference between the means of two independent samples.

**t-test for independent proportions** A parametric test of **statistical significance** used to determine whether there is a statistically significant difference between two independent proportions.

**t-test for means** - A parametric technique for comparing two means.

**t-test for r** -A parametric technique for determining if there is a non-zero correlation among two variables in the population.

**Two-stage random sampling** -A process in which clusters are first randomly selected and then individuals are selected from each cluster.

**Two-tailed test** -Use of both tails of the sampling distribution of a statistic – when a nondirectional hypothesis is stated.

**Type I error** -The rejection by the researcher of a null hypothesis that is actually true. Also called alpha error.

**Type II error** -The failure of a researcher to reject a null hypothesis that is really false. Also called beta error.

**Typical sample** -In qualitative research, a sample judged to be representative of the population of interest.

## **U-Z**

**Unit of analysis** -The unit that is used in data analysis (individuals, objects, groups, classrooms, etc.).

**Unobtrusive measures** -Measures obtained without subjects being aware that they are being observed or measured, or by examining inanimate objects (such as school suspension lists) that can be used in order to obtain desired information.

**Validity** -The degree to which correct inferences can be made based on results from an instrument; depends not only on the instrument itself, but also on the instrumentation process and the characteristics of the group studied.

**Validity coefficient** -An index of the validity of scores; a special application of the correlation coefficient.

**Variability** -The extent to which scores differ from one another.

**Variable** -A characteristic that can assume any one of several values, for example, cognitive ability, height, aptitude, teaching method.

**Variance (SD<sup>2</sup>)** -The square of the standard deviation; a measure of variability.

**Wilk's lambda** -The numerical index calculated when carrying out MANOVA or MANCOVA.

**z-score** -The most basic standard score that expresses how far a score is from a mean in terms of standard deviation units