ANSWERS AND HINTS TO STUDY QUESTIONS (SQs)

CHAPTER 4: Quantitative Research

SQ4-1: Scientific research is systematic, controlled, empirical, and critical investigation of natural phenomena guided by theory and hypotheses about the presumed relations among such phenomena.

SQ4-2: Major steps in conducting empirical research are (a) identification of a problem in the area of interest, (b) statement of the general purpose of the study, (c) statement of the research question(s) and related hypotheses, (d) description of the research design and procedures, (d) data analysis, and (e) interpretation of the results and generalization of the findings.

SQ4-3: Research questions and hypotheses that are too specific tend to leave out important variables and relations. Too much specificity produces trivial hypotheses and limits the scope of generalization.

SQ4-4: Research questions and hypotheses that are too general are NOT amenable to testing and, therefore, must be avoided.

SQ4-5: NO, because correlation does not mean causation.

SQ4-6: Strong correlations may lead to the generation of hypotheses about possible causal effects that can be further examined in causal-comparative or experimental studies.

SQ4-7: Ex post facto (“after the fact”) research is conducted to investigate cause-and-effect relationships by analyzing data on events that have taken place in the past [see section 4.2.1.3].

SQ4-8: True experimental research is conducted with the purpose of testing hypotheses about possible causal effects by manipulating independent variable(s) believed to produce such effects and controlling for all other relevant variables [see section 4.2.2.1].

SQ4-9: Full randomization in assigning participants to treatment groups is achieved when (a) the study participants are randomly selected from a well-defined population, (b) these participants are then randomly assigned to groups, and (c) the groups are randomly assigned to treatment conditions.

SQ4-10: The main characteristics of the true experimental research are (a) manipulation of the independent variable(s), (b) fully randomized assignment of participants to treatment groups, and (c) controlling for possible confounding variables.

SQ4-11: c.
**SQ4-12:** The *internal validity* question is whether the study results are due only to the manipulation of the independent variables, or whether there are also some confounding effects produced by insufficient control in the experimental design.

**SQ4-13:** The *external validity* question is whether the results are generalizable to persons, contexts, or measurement instruments beyond the specific settings and/or circumstances of the experimental study.

**SQ4-14:** False.

**SQ4-15:** Threats to *internal validity* — history, maturation, pretesting, measuring instruments, statistical regression (toward the mean), differential selection, experimental mortality, and interaction among such factors (e.g., interaction between differential selection and maturation).

**SQ4-16:** Threats to *external validity* — interaction of selection biases with experimental treatment, reactive effect of pretesting, and multiple-treatment interference.

**SQ4-17:** c.

**SQ4-18:** The external validity of this study is threatened by interaction of selection biases with experimental treatment.

**SQ4-19:** An internal validity threat is likely to occur due to maturation.