Chapter 2

IDENTIFICATION OF A RESEARCH PROBLEM

I.      Chapter Objectives for the Reader

Upon completion of the chapter, the reader should be able to:

- describe different types of variables such as independent variables, dependent variables, and control variables and provide examples of each type.

- identify different types of variables in the context of specific research studies.

- identify sources for research problems in education.

- provide adequate statements of example research problems in both declarative and question form.

- identify the criteria for adequate hypotheses.

- distinguish between directional and non-directional hypotheses.

- develop one or more hypotheses from a research problem statement.

- identify types of variables, develop related hypotheses, and identify necessary operational definitions, given a research problem statement.

II.     Suggested Exercises and Activities

1       Discuss with the students different types of variables and have them provide two or more examples of each type.

2       Have each student in the class locate a report of a research study (for example, in a periodical) and identify (a) the research problem, (b) any hypotheses implied or stated, and c) the variables and their types.

3       Provide for the students copies of one or more research reports and have the students read them for the purpose of identifying the research problem, hypotheses and variables. Check the consistency of the students in their results, and discuss any differences.

4       Have the students, either as the entire class or in smaller groups, consider the following research problem statement:  "A study of the relationship between years of teaching experience and teaching effectiveness."  Discuss factors that need to be considered in order to make this a researchable problem; factors such as:  a) possible limitations, for example, only involving elementary school teachers, b) operational definitions of the variables, and c) tentative, related hypotheses.

5       Have the students individually consider the following research problem statement:  "A study of the effects of three types of reinforcement upon achievement in mathematics of junior high school students." The study is to be conducted in a large junior high school (grades 7, 8 and 9) with intact classes, involving several teachers who teach mathematics. Students are to identify the dependent variable, independent variables (including possible control variables) constants and possible intervening variables.  Also, have students identify three or so possible hypotheses for this study. After students have done this task individually, have them discuss their results.

III. Test Items

2.1     The minimum number of levels or categories for an independent variable is:

a. no minimum number.
b. any odd number.
c. one.
d. two.
DL: E

2.2     If an experiment were being conducted involving the use of different teaching     materials for fifth grade reading instruction, teaching materials would likely be:

a. an independent variable.
b. an intervening variable.
c. a dependent variable.
d. a control variable.
DL: M

2.3     In a study of the effects of teaching method upon science achievement, the     differences between the four schools in which the study was conducted were also     determined. School is:

a. a dependent variable.
b. a moderator variable.
c. a control variable.
d. an intervening variable.
DL: M

2.4     In an experiment involving both boys and girls from grades 4-8, the effects of     school organization upon reading achievement is studied. The dependent     variable is:

a. sex of the students.
b. grade level.
c. type of school organization.
d. reading achievement.
DL: M

2.5     In an experiment, a variable such as gender or age cannot be:

a. an independent variable.
b. a control variable.
c. an experimental variable.
d. an intervening variable.

2.6     In an instructional experiment involving several teachers, teaching style would most likely be:

a. a control variable.
b. a dependent variable.
c. an experimental variable.
d. an intervening variable.
DL: M

2.7     In a research study, which of the following could not serve as a dependent variable?

a. reading test score
b. age in months
c. performance on a physical task
d. measure of anxiety
DL: E

2.8     A research problem is stated as, "What is the nature of instruction in the High School for Science and the Arts of City A?" The type of research implied is:

a. experimental.
b. ethnographic.
c. historical.
d. action.
DL: M

2.9     A research problem is stated as, "The effects of two types of instruction upon achievement in mathematics and reading of fourth grade students." The study is being conducted in six elementary schools with intact classes. This is an example of:

a. ethnographic research.
b. survey research.
c. quasi-experimental research.
d. experimental research.

DL: M

2.10    When the effects of a moderator variable cannot be determined, essentially, it becomes:

a. a dependent variable.
b. an independent variable.
c. a control variable.
d. an intervening variable.
DL: M

2.11    Which of the following is an operational definition of anxiety?

a. an uneasiness of mind over an anticipated, unpleasant situation
b. a score obtained by measuring alterations in galvanic skin response
c. a fear of the unknown
d. a psychological trait that may or may not be inherited.
DL: M

2.12    An experimental variable is a dependent variable.
a. True
b. False
DL: E

2.13    A hypothesis is a:

a. true statement unless proven false.
b. false statement until proven true.
c. statement of fact.
d. conjecture.
DL: M

2.14    "A negative relationship exists between time required to complete a cognitive task and score on an
        I.Q. test," is an example of a:

a. directional hypothesis.
b. nondirectional hypothesis.
c. null hypothesis.
d. b and c above.
DL: M

2.15    For the following hypotheses statements, indicate whether the hypothesis is directional (D) or
        nondirectional (N).

_____The reading achievement of students taught by Method A equals that of
students taught by Method B.

_____Opinions of school administrators toward central office policies are more
positive than those of teachers.

_____There is a positive relationship between scores on an attitude towards
school inventory and science achievement.

_____Performance scores on a manual dexterity measure are higher for first
grade girls than for first grade boys.

DL: C

2.16    "The science achievement of seventh grade students taught in a laboratory setting is greater than that of students taught in a traditional classroom," is an example of a:

a. null hypothesis.
b. directional hypothesis.
c. nondirectional hypothesis.
DL: M

2.17    The type of research in which we are most likely to encounter foreshadowed problems as supplements to hypotheses is:

a. survey.
b. historical.
c. experimental.
d. ethnographic.
DL: E

2.18    In a study of the nature of instruction in elementary school, bilingual classrooms, "the pattern of language usage between teachers and students," is:

a. a null hypothesis.
b. a control variable.
c. a research hypothesis.
d. a foreshadowed problem.
DL: M

2.19    The type of research in which we would be least likely to find a statistical hypothesis is:

a. survey.
b. quasi-experimental.
c. historical
d. experimental.
DL: M

2.20    An experiment is conducted to determine the effects, if any, of different instructional materials upon the reading achievement of fourth graders. Learning style of the students most likely would be:

a. a control variable.
b. an intervening variable.
c. an experimental variable.
d. a dependent variable.
DL: M

2.21    "The physical performance scores of boys and girls on PP Test ABC are equal," is an example
        of:

a. a null hypothesis
b. a directional hypothesis
c. an alternate hypothesis
d. an intervening hypothesis
DL: M