

EDPS 340 Multiple Choice Items

Dr. Kyung-Hee Kim
Eastern-Michigan University

Multiple Choice

1 → 1. The capital city of Canada is

3 → [a. Vancouver
b. Montreal
c. Toronto
*d. Ottawa] ← 4

2 →

- 1. **Stem:** presents the problem
- 2. **Keyed Response:** correct or best answer
- 3. **Distracters:** appear to be reasonable answers to the examinee who does not know the content
- 4. **Options:** include the distracters & the keyed response.

Multiple Choice

- **Characteristics:**
 - Problem (stem)
 - Suggested solutions (options)
- **Types:**
 - Direct Question
 - Incomplete statement

Types of Multiple Choice Items

- **Correct Answer***
 - Only one correct response
- **Best Answer**
 - requires examinee to select option closest to being correct
 - fine distinctions
- **Multiple Answer**
 - More than one correct or best answer

Multiple Choice

- **Knowledge:**
 - More complex (e.g., why questions) have more possible correct answers (i.e., choose the best answer)
- **Types of knowledge assessed**
 - Terminology
 - Specific Facts
 - Principles
 - Methods & Procedures

Multiple Choice

- **Types of understanding & application assessed**
 - Ability to identify application of facts & principles
 - Ability to interpret cause-effect relationships
 - Ability to justify methods & procedures

Ambiguity

•Extrinsic

- Desirable quality in multiple choice items
- Outside the item
- Allows discrimination between those who know material & those who do not.

•Intrinsic

- Undesirable
- Should be avoided
- Inside the item
 - poor wording
 - more than one answer
- Even those who know content have difficulty choosing correct answer

Guidelines for Writing Multiple Choice Items

- Place most of the subject matter in the Stem
 - ensures full statement of problem
 - Poor: Multiple-choice items
 - a) may have several correct answers.
 - b) consists of a stem & some options.
 - c) always measure factual details.
 - d) does not have a problem or question posed in the stem.
 - Better: The components of a multiple-choice item are a
 - a) stem & several distracters.
 - b) correct answer & several distracters.
 - c) stem, a correct answer, & some distracters.
 - d) stem & a correct answer.

Guidelines for Writing Multiple Choice Items

- State stem in the form of a question.
 - Poor: Canada is
 - a) a country
 - b) where you live
 - c) between the Pacific & Atlantic oceans
 - d) all of the above
 - Better: Between which two oceans is Canada located?
 - a) Atlantic & Indian
 - b) Atlantic & Pacific
 - c) Pacific & Indian

Guidelines for Writing Multiple Choice Items

- Present the Problem in Novel Terms
 - some novelty; but not too much!
 - If we use novel item types
 - must make sure that students understand the new process
- Eliminate irrelevant material from the Stem
 - to measure student achievement, not to present new material
 - maximize use of time for demonstrating understanding, not reading ability

Guidelines for Writing Multiple Choice Items

- Avoid Negatively phrased Stems
 - use only when learning outcome requires this type of differentiation
 - Poor: Which of the following is NOT a method of determining test reliability?
 - a) Coefficient of equivalence
 - b) Coefficient of stability
 - c) K-R #20
 - d) Split-halves procedure
 - e) Test-criterion intercorrelation

Guidelines for Writing Multiple Choice Items

- Ensure similarity among options with regard to:
 - grammatical structure
 - length
 - mode of expression
- Grammatical errors provide unintentional clues to the answer

Guidelines for Writing Multiple Choice Items

- **Options should be Grammatically Parallel & Consistent with the Stem**
 - Poor: A test which can be scored by a clerk untrained in the content area of the test is an
 - a) diagnostic test.
 - b) criterion-referenced tests.
 - c) objective test.
 - d) reliable test.
 - e) subjective test.

Guidelines for Writing Multiple Choice Items

- **Eliminate Grammatical or Verbal Clues**
 - Avoid parallel language between the Stem & the Correct Response
 - Poor: The major purpose of item analysis is to
 - a) determine the distribution of test scores.
 - b) analyze the patterns of examinee responses.
 - c) determine whether the test content was appropriate.
 - d) find out if the test is reliable.
 - e) evaluate the overall difficulty of the test.

Guidelines for Writing Multiple Choice Items

- **Insure that correct responses are not consistently shorter or longer than the distracters**
 - Poor: A random sample is one in which
 - a) subjects are selected by levels.
 - b) each subject has an equal probability of being chosen for the sample.
 - c) every nth subject is chosen.
 - d) groups are the unit of analysis.

Example: Length of Alternatives

Poor: Neurotics are more likely than psychotics to

- a) be dangerous to society
- b) have delusional symptoms
- c) be dangerous to themselves
- d) have insight into their own inappropriate behavior but nevertheless feel rather helpless in terms of dealing with their difficulties

Guidelines for Writing Multiple Choice Items

- **Options Should be Mutually Exclusive**
 - Poor: What should be the index of difficulty for an effective mastery-model test item?
 - a) Less than 10
 - b) Less than 20
 - c) More than 80
 - d) More than 90

Guidelines for Writing Multiple Choice Items

- **Make one of the options the most clearly correct or best answer**
 - exception: multiple answer form
 - reduces intrinsic ambiguity
 - reduces *frustration* during test
- **Make distracters plausible**
 - desire to attract students who really do NOT know the answer to the question
 - create distracters from elements of the correct response
 - improves reliability of item

Guidelines for Writing Multiple Choice Items

- For discussion, but should not be included in an examination.
 - Poor: The most serious aspect of the energy crisis is the
 - a) possible lack of fuel for industry.
 - b) possibility of widespread unemployment.
 - c) threat to our environment from pollution.
 - d) possible increase in inflation.
 - e) cost of developing alternate sources of energy.
 - **Better:** According to Professor Koenig, the most serious aspect of the energy crisis is the
 - a) possible lack of fuel for industry.
 - b) possibility of widespread unemployment.
 - c) threat to our environment from pollution.
 - d) possible increase in inflation.
 - e) cost of developing alternative sources of energy.

Guidelines for Writing Multiple Choice Items

- **Select Diagnostic Distracters Such as**
 - Cliches
 - Common Misinformation
 - Logical Misinterpretations
 - Partial Answers
 - Technical Terms or Textbook Jargon

Guidelines for Writing Multiple Choice Items

- **Options should be presented in a logical, systematic order**
 - What type of validity is determined by correlating scores on a test with scores on a criterion measured at a later date?
 - a) Concurrent
 - b) Construct
 - c) Content
 - d) Predictive

Guidelines for Writing Multiple Choice Items

- **Randomly distribute answers across the option positions**
 - The correct answer should appear in each of the option positions an approximately equal number of times, but in random order
 - inexperienced test writers emphasize “b” & “c” options (hide the answer!!)
 - do NOT use an interpretable order of keyed responses

Guidelines for Writing Multiple Choice Items

- **Use qualifiers such as “all of the above” & “none of the above” sparingly**
 - *testwise students will use process of elimination to select answer*
 - *do NOT use to “pad out” the distracters because you cannot think of another one.*

Advantages of Multiple Choice Items

- Allow more adequate sampling of content.
- Tend to more effectively structure the problem to be addressed
- Items can be more efficiently & reliably scored than supply items
- Different response alternatives can provide diagnostic feedback (item analysis)
- Items can be constructed to address various levels of cognitive complexity

Advantages of Multiple Choice Items

- **Over short answer:**
 - Reduced possibility of ambiguity because the alternatives structure the questions

Advantages of Multiple Choice Items

- **Over true/false:**
 - Students can not receive credit for simply knowing that a statement is incorrect
 - Best choice types make it possible to measure outcomes that are not true or false, but vary in the degree of appropriateness
 - Greater reliability per item

Advantages of Multiple Choice Items

- **Over matching:**
 - No need for homogeneous material

Disadvantages of Multiple Choice Items

- Difficult & time consuming to construct good items
- High degree of dependence on student's reading & instructor's writing ability
- Can lead the instructor to favor simple recall of facts
 - Measuring synthesis & evaluation can be difficult

Disadvantages of Multiple Choice Items

- Requires selection of the correct answer
 - i.e., not good to use with problem-solving or ability to organize ideas
- Finding sufficient number of plausible distracters
 - particularly for young children
- Takes longer to answer than other types of questions
 - e.g., 3 true/false = 1mc