

Session 8

Elements and Types of Tests of Cognitive Learning

A. Introduction



Image 1: The Philippines' education investment scores top marks (Source: Albert, 2015: Online)

It is a well-established fact that learning and teaching are two activities that go hand in hand with one another. Teaching and learning co-occur; in this context, we need methods to ensure that teaching and learning are in sync. Test, examination, evaluation, assessment, and measurement are all examples of terms that are frequently interchanged with one another in everyday conversation.

Assessment is an essential teaching component since it allows teachers to evaluate their student's progress and performance. Knowledge and learning progress are most commonly assessed through testing today.

However, other people argue that tests aren't helpful because they're frequently low quality and don't reflect students' understanding.

This lecture will guide you with the various evaluation forms, the most popular tests, the advantages of each, and most importantly, the characteristics of quality tests and the general prerequisites for practical testing.

Session 7 Conclusion

Based on Bloom's taxonomy, systematic learning is geared toward learning concepts, contexts, and competencies. Therefore, the bases of instruction and assessment are the learning competencies stated in SMART learning objectives.

B. Session Objectives

After taking this lecture, you are expected to:

1. Identify and describe the elements of a good test of learning; and,
2. Characterize the various types of objective tests and their purposes.

C. Session Content

1. Elements of a Good Test

An efficient examination that precisely assesses student comprehension can be produced with the assistance of carefully considered test questions and answers. When students take tests designed with learning objectives in mind, the questions assist students in developing good study habits, affect how well students retain information, and prepare them for summative evaluations. In addition, when students perceive that an evaluation is objective and pertinent to their learning, they are less likely to participate in dishonest academic behavior.

The following elements and components are considered when designing the test and crafting the test items.

Objectives and Desired Learning Outcomes. We discussed in the previous lecture that test items are derived from the learning objectives and desired or expected outcomes. The test constructor deliberately tries to ensure that the test questions are mapped out from the learning outcomes statements.

Test Type. The desired learning outcomes can hint at the type of test that must be chosen. For instance, if the learning outcome requires the learner to discuss a concept, an essay type may be appropriate. The identification type or matching type may be relevant when the learning outcome is remembering and understanding.

Cohesiveness. Ensuring that the mechanics and directions of the test jive with the learning objectives is very essential. Cohesiveness is the quality assurance measure taken seriously by the teacher, test constructor, or evaluator. In the Philippines, subject area coordinators, head teachers, and master teachers are the evaluators of test instruments, especially for summative, periodic, and year-end examinations. They verify and validate or coach the test constructors to determine whether the test mechanics, directions, and test items match the learning objectives and the skills being assessed.

Language. Aside from the cohesiveness of the test with the learning objectives and skills being measured, how the test items are written is also vital in keeping the validity of the test. It is recommended that test constructors write the items in the language of instruction. This means how the teacher taught the particular lesson shall be the basis for how the items are written. Using the technical terms and concepts ensures that students are assessed on how they learned from the teacher's instruction.

Validity. The test is valid when the learning objectives are based on the mechanics, directions, and items. The validity of a test is defined as its ability to consistently and accurately measure its intended constructs. Whether or not inferences, conclusions, and judgments based on test scores are reasonable and relevant is another aspect of test validity.

Reliability. The reliability of a test can be defined as the degree to which an individual's performance on the test remains stable throughout multiple administrations of the same instrument using the same set of items. This measure is usually ensured by creating multiple test items of the same learning outcome in various forms or scattered in the instrument. If a student gets an item correctly, he is expected also to get the other similar items correctly.

The reliability of a test can only be as good as its validity. Reliability is meaningless without a rigorous test. Talking about dependability is pointless if the question test is invalid, as validity must be established first. Similar to how an invalid test would lack reliability.

2. Various Types of Objective Tests

An objective-type test is mainly attributed to having an absolute answer for every test item (Kubiszyn & Borich, 2007). This course will only focus on assessing students' cognitive learning in remembering, understanding, applying, analyzing, and evaluating. The creating skill cannot be measured using objective-type tests because students may provide responses that the assessor cannot expect.

This lecture focuses on these test types to guide you on when to use a specific type and how to design it. Always remember that the choice of test depends on the skill being assessed based on the learning outcome statement. In our succeeding lectures, however, we will be more particular about designing and arranging the test items and the validation check to be considered in quality assuring the test instrument.

These objective-type tests are commonly accepted and used in basic education schools: Identification, Matching-Type, Dichotomous (e.g., True or False), Enumeration, Key-List, and Cloze Test. Note that the multiple-choice type is not included in this lecture because it will be highlighted in the next lecture.

Identification. The identification test is usually used to test simple recall of the key terms or words, and exact information, such as names, places, dates, and terminologies. This type of test is used as a formative test to measure how students remember the essential and fundamental terms in the lesson. However, this type is not recommended to be used as a summative or achievement test because it lacks the ability to measure higher-order thinking and learning competence.

Advantages:

- It is easy to prepare because the test constructor will just state the definition or description of the term or fact being asked.
- It reduces the possibility of guessing because students must provide the expected information and not choose from the options.
- It can test the lowest level of learning, however, the most fundamental form.

Disadvantages:

- It can only measure rote memory.
- It cannot measure complex learning outcomes.
- It may reduce the validity of the test, especially when it is used to measure learning competencies.

How to construct Identification Tests

- State the test items or questions using specific qualifiers so there will be only one possible correct answer.
- Avoid using qualities or descriptions that can refer to several possible answers.
- Paraphrase the test items from the exact content shown in lectures or textbooks.
- If the test is fill-in-the-blank type, avoid placing multiple blanks in each statement. Assign a blank for every context.
- Avoid giving irrelevant clues, such as varying lengths of blank lines that can prompt the length of the correct answer or mentioning it or part of it in the test item.

Matching Type. Matching items is an assessment type that helps students practice their analytical thinking skills. In this activity, students are given a series of stems or premises, which are statements or ideas, and they need to match them with the correct response or principle. This exercise encourages students to analyze the information and carefully connect different concepts. By engaging in matching activities, students can enhance their cognitive abilities and improve their understanding of the subject matter.

Advantages:

- Excellent for those with a weaker proficiency in reading
- There is less room for error than with other types of questions.
- Capable of encompassing a wide range of topics.
- Simple to read and comprehend
- Simple to grade Computerized online grading

Disadvantages:

- It can be laborious to come up with questions for.
- If there are too many potential matches, the user may become frustrated.
- Users spend a lot of time on tests, especially timed ones.

How to Construct Matching Tests

- Specify the steps to be taken.
- Don't make the columns too different from one another.
- Reusing of the answers may be allowed.
- If feasible, alphabetize, number, and/or date the list of responses.
- To prevent pupils from answering via elimination, give them more possible answers than question stems.

Dichotomous. Dichotomous tests have only two opposing choices: True or False, Acceptable or Unacceptable, Advantage or Disadvantage, etc. Since true/false tests are easy to make and don't require teachers to come up with many possible but incorrect replies, they are the most popular choice. A true/false question can only contain one statement, which must be either obviously true or obviously false; therefore, care must be used when constructing them.

Advantages:

- It is easy to prepare.
- Students are tested on their evaluative thinking skills if items are rationally written.
- It tests the ability of the students to distinguish between what is right and what is wrong.

Disadvantages:

- One of the least trustworthy methods of evaluation
- Usually constructed so that the vast majority of the assertion is correct, save for one insignificant detail that renders the entire thing false.
- Incentives for guessing correctly and more guessing are encouraged.

How to Construct True/False Tests

- Don't use negation or double negation. These may needlessly throw students off.
- Keep the number of lies slightly higher than the number of truths. When unsure about an answer, students often choose "true" as a safe option.
- Just don't bother with it. Check that your true/false questions directly assess course objectives.

Enumeration. When teachers want to assess how students think deductively, the enumeration type of test is used. There are at least two classifications of enumeration tests. The recall enumeration test only requires identifying the components of a particular category previously discussed in class. On the other hand, the deductive enumeration test assesses the learner's ability to provide examples, applications, components, uses, functions, and other more particular concepts drawn from a major concept.

Advantages:

- It is easy to prepare because the test constructor only provides a category and the number of possible sub-categories students need to supply.

Disadvantages:

- If the given category has pre-determined sub-categories, the test is only a simple-recall test.
- It may be a weak type of test when included in the summative test.

How to Construct an Enumeration Test

- If used as a formative test, specify clearly the main category so that students can give precise answers based on the actual lesson.
- If used as a summative test, phrase the main category so that students are challenged to provide characteristic components that can be deduced rationally.
- Avoid using categories directly lifted from the provided content with pre-determined components.

Keylist Test. This test is characterized by a set of criteria from which students classify the test items accordingly. It is somewhat similar to a multiple-choice test, but the choices are used for every given item. For example, students are assessed on their understanding of the distinction of the three domains of teaching. Therefore, in every situation, the students can choose from cognitive, affective, or psychomotor.

Advantages:

- It is a simpler version of the multiple-choice test because there are common options for all the questions.
- It is more reliable than the true-false test because choices can be increased to more than two.

Disadvantages:

- There is a higher chance that items may not parallel the choices.
- Unlike the multiple-choice test, the keylist test cannot be used in any lesson to be assessed. It may only be limited to lessons with categories or classifications in the content.

How to Construct a Key-List Test

- Determine the multiple criteria or categories first before writing down the test stems.
- The categories should be parallel to each other to constitute a scale, a combination of criteria, varying conditions, etc.
- Code the list of criteria (e.g., letters, numbers, basic shapes) so that students can just choose and write the code or shade their indicated spaces.
- When constructing the test stem, begin by indicating the expected code, then design the item to comply with the correct choice.

Cloze Test. A cloze test is an activity, test, or evaluation in which the student is given a portion of text that has been obscured and is asked to fill in the portion of the text that has been hidden. When taking a cloze test, you need to have a strong understanding of the context and the vocabulary to select the appropriate words or parts of speech that should go in the passages that have been removed. This activity is frequently used as part of the assessment process for learning a native or second language as well as instruction in such languages.

Advantages:

- It is simple to put together and straightforward to evaluate if the exact word scoring approach is utilized.
- Because it is possible to delete numerous words simultaneously, many elements can be removed from a text while maintaining its overall length.
- It is asserted that this exam is a valid metric for determining reading comprehension.

Disadvantages:

- It can be challenging to assess whether or not a particular word is appropriate for the content being discussed. Therefore, it takes a considerable amount of time to check.

How to Construct a Cloze Test

- Write the paragraph you want your students to narrate or interpret based on the content.
- Determine the terms or essential words your students need to remember, understand, and use in the paragraph.
- Replace the chosen words with blanks, but you need to place clues or hints that indicate the number of letters of the word.

D. Conclusions

1. The test instrument is grounded on the statements of learning outcomes or objectives. The test type, mechanics, and language are cohesive with the learning objectives, which will also determine the instrument's validity and reliability.

2. The objective type of testing is preferred to be used when the teacher needs to assess the cognitive skills expected to be learned by the students by giving absolute responses.

E. References

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