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ABSTRACT

Attitudes and attitude measurement are critical components of teaching and learning and the instructional developer should collect as much relevant data about that process as possible. It is important for instructional developers to study the attitudes of learners in order to demonstrate attitude/achievement relationships, promote attitudinal position, reduce attitudinal influence, and to assess the impact of specific instruction. Attitude measurement should be valid, reliable, replicable, and fairly simple to administer, explain, and understand. Categories for collecting attitude information include self-reports, reports of others, sociometric procedures, and records. To insure effective attitude measurement, one must identify the construct to be measured and find an instrument that will measure the relevant construct. If no existing measure is available, the instructional developer will need to construct his/her own test, recognizing the critical importance of reliability and validity of information. A pilot study should be conducted in order to revise tests for actual use. When testing is completed, resulting data must be summarized, analyzed, and displayed for the consumer. A bibliography and examples of the measurement process are included. (CWM)

TITLE: Measuring Attitudes and Instructional Development: Why and How

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Media specialists and instructional developers generally ask three questions when the measurement of attitudes is promoted as a component of the instructional design process.

- Why are attitudes important in the teaching/learning process?
- Why is it important to measure attitudes?
- How are attitudes measured?

This paper will attempt to answer these questions.

Part I. Importance of Attitudes and Attitude Measurement

When the instructional developer designs a classroom activity there should be at least two categories of learning outcomes in mind--those directed toward cognitive goals, and those related to the attitudes of the learner. There is little need to discuss the rationale for the importance of information acquisition by a learner as a result of instruction. The need for establishing attitudinal goals and for planning activities designed to produce affective outcomes in learners as a consequence of an instructional sequence is a little more difficult to explain to many. However, it has become increasingly apparent to many involved in educational technology research that one of the major, unique consequences of mediated instruction is not directed toward knowledge gain. Rather, instruction from television, film and slides often produces certain attitudinal positions in students not necessarily found when media are not used in teaching. In a recent review of educational technology research it was found that when attitude hypotheses were tested, over fifty percent of the time desired attitudinal positions or changes were produced (Simonson, 1977; 1979a; 1979b). In other words, in about

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Additionally, attitudes have three components: affective, cognitive, and behavioral (Zimbardo and Ebbeson, 1970). The affective component is said to consist of a person's evaluation of, liking of, or emotional response to some object or person. The cognitive component is conceptualized as a person's beliefs about, or factual knowledge of, the object or person. The behavioral component involves the person's overt behavior directed toward the object or person.

Part II. How Attitudes are Measured

Since attitudes are defined as latent, and not observable in themselves, the instructional developer must identify some behavior that would seem to be representative of the attitude in question, so that this behavior might be measured. This characteristic of attitude measurement is justifiably the most criticized limitation of this area of educational evaluation. However, without going into the question of the over-all validity of attitude measurement, there are several generally recognized procedures used to determine an individual's or group's attitude toward some object or person. It is those procedures that are outlined below.

CHARACTERISTICS OF MEASUREMENT: Before procedures for measuring attitudes are discussed, there are several characteristics of measurement, in general, that should be considered in order to determine if an evaluation technique is an effective one. Basically, attitude measures should:

- be valid -- In other words, is the instrument appropriate for what needs to be measured?
- be reliable -- Does the measure yield consistent results?

- be fairly simple to administer, explain, and understand -- Generally, the measures that yield a single "score" of an attitude position epitomize the intent of this characteristic, although the single "score" may be deficient in meeting the intent of other characteristics of good measurement.
- be replicable -- In other words, someone else should be able to use a measure on a different population, or in a different situation, to measure the same attitude.

CATEGORIES OF ATTITUDE MEASUREMENT: Basically, there are four categories, or approaches, for collecting attitude information. These approaches are:

- self-reports, where the members of a group report directly about their own attitudes,
- reports of others, where others report about the attitudes of a person or group,
- sociometric procedures, where members of a group report about their attitudes toward one another, and
- records, which are systematic accounts of regular occurrences, such as attendance reports, sign-in sheets, library check-out records, and inventories.

Within each of these categories there are one, or more, strategies for measuring attitude-related behaviors. Most commonly, attitude measurement is accomplished by one of the following techniques.

- questionnaires
- rating scales
- interviews
- written reports
- observations
- sociometrics

PROCESS FOR ATTITUDE MEASUREMENT: Any attempt at measurement, including the evaluation of attitude, requires that a systematic process be followed. Such procedures will not guarantee an effective measurement, but they do increase the likelihood of this occurring considerably. Generally, there are six steps to be followed during the attitude measurement process.

1. Identify Construct to be Measured - A learner could conceivably have an attitude position toward any object, situation, or person. When instruction is designed, those attitudes that are important to the learning activity should be clearly identified and defined. For example, if the developer of instruction wanted to ascertain the impact of a certain type of media on learners, the construct "attitude toward instruction by film" could have been an attitude outcome that was evaluated.

2. Find an Existing Measure of the Construct - Once a certain attitude has been identified, the designer should attempt to locate an instrument that will measure the relevant construct. Generally, such tests will have been tried out in other instructional situations and should include some statement of reliability and validity. Additionally, instructions for administration of the test selected should be included. This will simplify the job of using the instrument for the instructional developer.

The most obvious disadvantage to using a pre-prepared measure is that it may not be evaluating the specific attitude construct being studied. Even if this is the case, it may sometimes be possible to extract valuable information from an instrument designed to test an attitude position similar to the one of specific interest.

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to determine. Validity for a test depends on a number of factors, such as the type of test and its intended use. Basically, there are four categories of validity.

- Construct validity (or the extent to which you can be sure a measure represents the attitude construct whose name appears in its title) can be determined by:
  1. opinions of judges,
  2. correlations to other measures of the same construct,
  3. measures of criterion group subjects (those who obviously possess the construct), or
  4. appeals to logic.
- Content validity (or the representativeness of the sample of questions included in the instrument) is usually determined by careful analysis of the items in the test. There is no simple process to determine content validity other than a close, thoughtful examination of each item separately, and all items together.
- Concurrent validity (or the agreement of a test with a parallel form of the test on the same topic that was administered at approximately the same time) is determined by correlating the results of two parallel measures of the attitude. This correlation coefficient is reported as an index of concurrent validity.
- Predictive validity (or how well a measure will predict some future behavior) is determined by comparing results of an attitude test to some measure of behavior given at some point in the future. Again, this type of validity is usually expressed by a correlation coefficient found by comparing results of the two measures.

Obviously, determining validity is not a simple task. However, every instructional developer who constructs a test of any type should be acutely aware of the need to develop valid instruments. Since there is no single established method for determining validity, the test originator should use care in constructing, administering and interpreting tests, and their results. Finally, these precautions should be described to, and for, the consumer of the test data.

Reliability, or the ability of a measure to produce consistent results, is usually less difficult to determine than validity. There are several methods of determining reliability that can be easily used by the attitude test developer. The "Test-Retest" method involves the re-administration of the instrument to the target group and correlating the results. The "Split-Half" method uses an arbitrary division of the instrument into two halves. Results from each half are correlated and reported as a reliability coefficient. "Alternate-Form" reliability involves the correlation of the results of two parallel forms of tests of the same attitude construct. Each subject takes each form and the resulting correlation is reported as a reliability estimate.

Each of these techniques will yield a score from 0.00 to 1.00. The higher the number, the more reliable the test. Generally speaking, reliability coefficients above .70 are considered respectable. Scores above .90 are not uncommon for standardized attitude tests. As with validity, the results of reliability estimation should be reported to the consumer of your testing activities. (For more information on validity and reliability estimation see Anastasi, 1968; Cronbach, 1970; Fitz-Gibbon, 1978; Henerson, 1978; or Talmage, 1976).

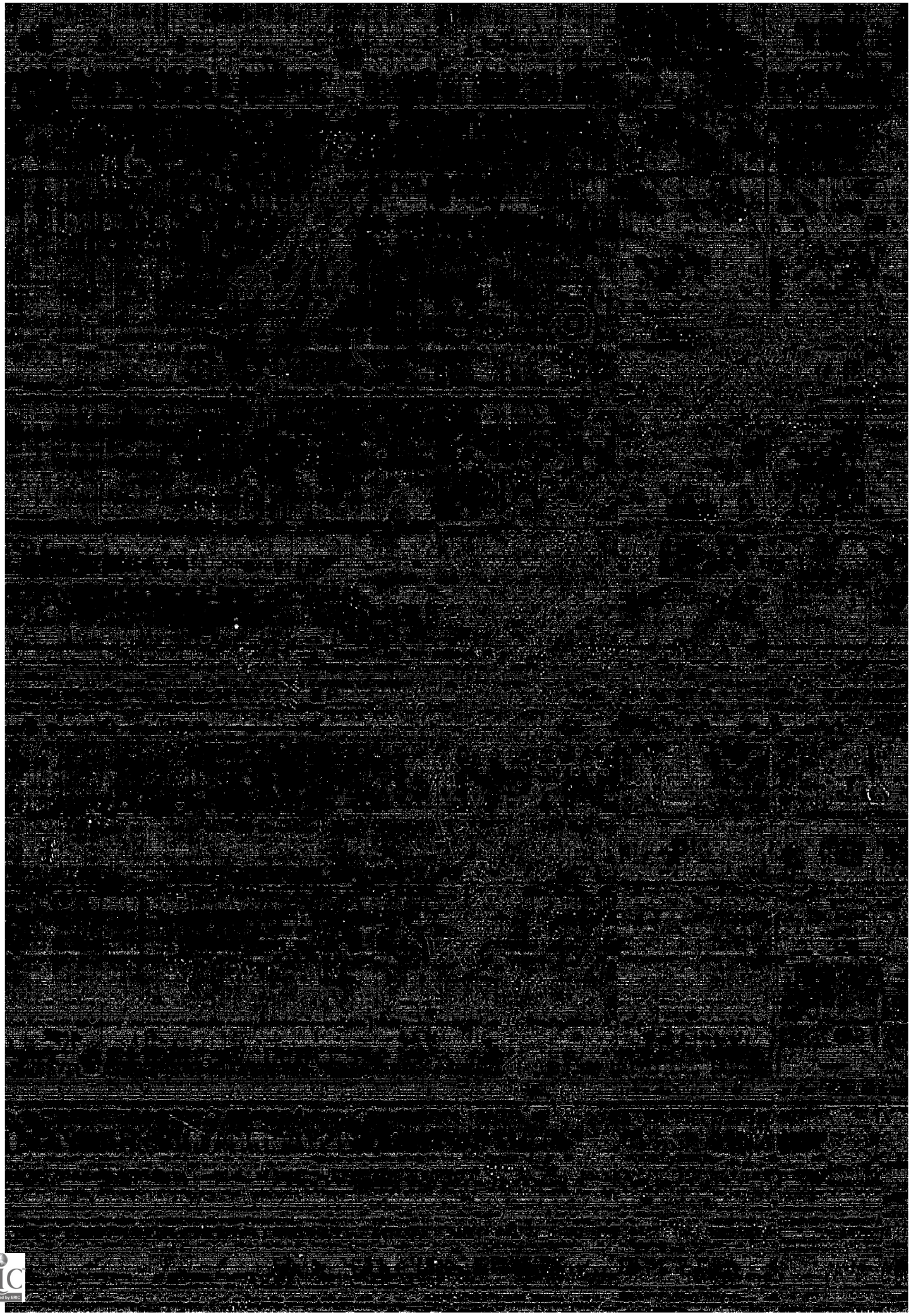
4. Conduct a Pilot Study - While it is possible to obtain validity and

reliability data during the actual testing portion of the instructional activity, it is much more logical to at least try out attitude instruments before they are formally used. This should be done in order to obtain appropriate data, but also to uncover minor, but troublesome, administrative problems, such as misspellings, poor wording, or confusing directions.

5. Revise Tests for Actual Use - Results of pilot testing should be used to revise, or "polish," attitude instruments. Once the "bugs" have been eliminated the measure is ready to be used with its intended target audience.

6. Summarize, Analyze, and Display Results - When testing is completed resulting data must be interpreted. Generally, attitude test results should be handled similarly to any other test information. Obviously, numerical data is easier to manipulate than verbal information. Whatever attitude responses have been collected, it is important to summarize, analyze and display the results in such a manner that they are easily and quickly understood by others. For example, raw data should be collected and recorded on some type of summary sheet. A "quick-tally" sheet is often used when data is to be hand scored (see Figure 2). When data is to be machine scored it should be recorded on the familiar 80 column coding sheet. This sheet corresponds to the standard 80 column computer card. An even simpler technique for coding data is to have students respond to attitude test items on a "mark-sense" (optical scoring) sheet. When this type of scoring sheet is used, the raw data can be easily accessed for computerized statistical analysis without the need for intermediate coding steps (see Henerson, 1978).

After data has been collected and coded it should be analyzed. Most researchers consider "Agreement Scale" data to be "Ordinal-Scale" (Ferguson, 1971), so it can by analyzed using standard tests of description



and inference However, data about instructional mode or content area is often useful if it is merel[illegible] averaged and compare[illegible] [illegible] In other words [illegible] "[illegible]

[illegible]

the impact this construct has on the learning process is not important. In

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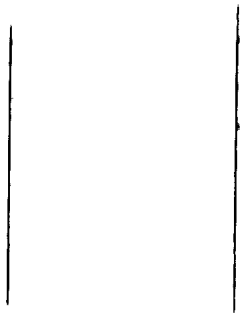
FIGURE 1 AGREEMENT SCALE

FIGURE 2 "QUICK TALLY" SHEET



Example: Of the 50 children interviewed, 12 boys and 13 girls reported [illegible] Of the [illegible] children interviewed, 25 reported [illegible]

The Agreement Scale

The more common agreement scale also consists of a series of attitude statements. Unlike the ordered scale, however, these sentences do not represent gradations of the attitude. They embody extreme statements either clearly favorable or clearly unfavorable. The agreement scale achieves a wide range of scores by having respondents report the *intensity* of an attitude. This is accomplished by providing gradations within the response alternatives. The respondents are asked to indicate their agreement with each statement on a 5 point scale.

The Ordered Scale

The ordered scale consists of a collection of statements that describe a range of opinions about an attitude object.

Steps for Constructing and Using a Semantic Differential

1. Determine the attitude object(s) you wish to investigate.
2. Select appropriate adjective pairs (approximately 10). You may wish to select from the list provided at the end of this chapter or from DiVesta's list if it suits your students. You may, on the other hand, wish to make up your own list.
3. Write the attitude object word or phrase at the top of the page and place the adjectives beneath it. If you are evaluating more than one attitude object, use the same [illegible] for each attitude object and keep the [illegible] and the [illegible] and "random polarity."