

# The Instructional Quality Profile: Training Teachers to Teach Effectively

Charles M. Reigeluth

## Abstract

This article discusses what the Instructional Quality Profile is and why it is a valuable tool for teacher training. The result of a large three-year instructional research and theory-construction project jointly funded by government, educational, and church institutions, the Profile (1) identifies six basic areas which influence the quality of instruction, (2) indicates specific aspects of quality in each area, and (3) prescribes specific methods for teachers and textbook writers to use in order to increase the quality of their instruction. The Profile's strengths are its unique "task-content" analysis of subject matter, its analysis of strategy components of instructional methods, and its identification of relations between the two.

Merrill (1972) has stated that a school could be thought of as containing at least two types of environments: an *inter-personal environment* and an *instructional environment*. He also stated that it is possible to identify two different types of teacher skills: *interaction skills*, with which a teacher interacts with a single student or a group of students, and *planning or design skills*, with which a teacher structures the interactions to bring about some specified objective. Combining these two types of skills with the two types of environments, one can identify four different areas for teacher training (see Figure 1): (1) instructional planning, (2) instructional interaction, (3) inter-personal planning, and (4) inter-personal interaction.

Of these four areas, *instructional planning* has been largely ignored or otherwise inadequately handled by many teacher training programs, mostly due to the fact that insufficient knowledge has existed in this area. Therefore, one of the major reasons for developing the Instructional Quality Profile was to provide teachers with knowledge about how to plan good instruction. Whatever instructional materials a teacher uses in his or her class (e.g., textbooks, films, workbooks), much of

the subject matter considered important by the teacher will not be presented adequately enough for many students to understand it in the manner desired. The Profile provides teachers with the necessary skills to identify such weaknesses and to plan the most effective ways to compensate for those weaknesses.

The following are some of the major problems related to instructional planning:

1. The instruction in the textbook is often not of the right nature for learning a topic in the way that the teacher thinks it should be understood. For instance, the textbook may be aimed at remembering a principle rather than at learning how to apply the principle. Given such mismatches between the teacher's intentions (or objectives) and the realities of the textbook, the teacher could provide certain kinds of knowledge or experience or practice to effect the kind of learning intended. For instance, providing examples of the way a principle explains actual events or phenomena may help the students to learn how to apply the principle rather than merely to remember it. But *what kinds of knowledge or experience or practice should the teacher provide in order to best effect each kind of learning intended?*
2. Even when there is no mismatch between the teacher's intentions and the realities of the textbook, the slower students may need additional kinds of knowledge or experience or practice in order to understand a topic. For instance, if a student does not understand what a metaphor is, the teacher could use a variety of techniques to draw the student's attention to those characteristics that make a set of words a metaphor. But *what are the most valuable techniques that can be used, and when is each of those techniques appropriate?*
3. Often a teacher's tests assess a student's ability to remember some knowledge rather than assessing the student's ability to apply or use that knowledge, even though the teacher's intentions or objectives are for application of the knowledge. For instance, in order to measure a student's understanding of a concept, the teacher might ask for the definition of the concept, rather than requiring the student to classify unfamiliar examples and nonexamples of the concept. *What kinds of guidelines can a teacher follow to facilitate making the right kinds of test items?*

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Figure 1

Four Important Areas for Teacher Training

		TEACHING ENVIRONMENTS	
		INTER-PERSONAL	INSTRUCTIONAL
TEACHING SKILLS	PLANNING	Inter-personal Planning	Instructional Planning
	INTERACTION	Inter-personal Interaction	Instructional Interaction

The Instructional Quality Profile is a tool to help provide a teacher with the skills and knowledge necessary to address and resolve each of these problems.

The Instructional Quality Profile (see Merrill, Reigeluth, and Faust, 1979, for a more thorough description) is the result of a large three-year research and theory-construction project jointly funded by government, educational, and church institutions. The purpose of this project was to identify the components of good methods of instruction, which often vary depending upon the objectives of the instruction. The final phase of the project entailed the production of a training manual (Merrill, Richards, Schmidt, and Wood, 1977) to help instructional designers improve their instructional design skills. Research and preliminary validation studies have shown the principles of the Profile to be of strong importance to student performance and therefore of great interest for teacher training.

The Profile is a unique outline of ways to analyze and improve instruction. These methods of analysis apply across a wide variety of media (e.g., classes, lectures, textbooks, films) and subject-matter areas, and they are categorized according to six basic areas which influence the quality of instruction (see Figure 2). (1) *Purpose-objective consistency*: is what you want students to know also what they need to know? (2) *Objective adequacy*: is what you want them to know usefully stated? (3) *Test-objective consistency*: are you testing what you want them to know? (4) *Test adequacy*: are you testing it well? (5) *Test-presentation consistency*:

are you teaching what you test? And (6) *presentation adequacy*: are you teaching it well?

There are two important reasons why the Profile is particularly effective for analyzing these six aspects of the quality of instruction (which are also reasons why it is an especially valuable tool for teacher training in the area of instructional planning): (1) it provides a unique understanding of *methods of instruction* by breaking them down into "strategy components," which have reliable effects on student learning, and (2) it provides a unique understanding of the *nature of subject matter*, including objectives and tests, as they relate to the six quality questions. These two unique aspects of the Profile are summarized below. The interrelations between the two are identified, and their impact on each of the six quality questions is described.

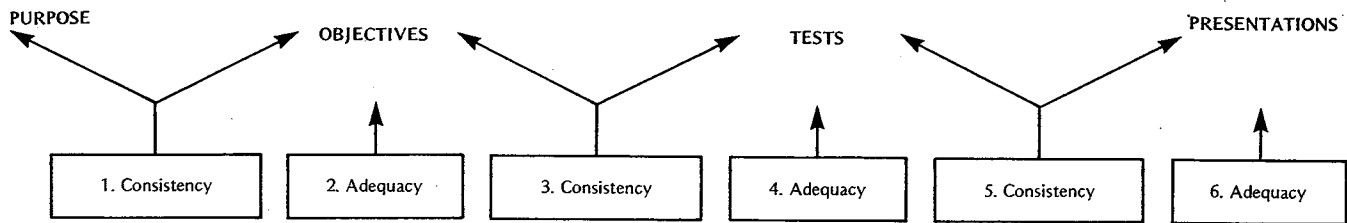
Note on Terminology

Some of the terms used in this article may not be familiar to the reader. The author has made every attempt possible to use familiar terminology. Where unfamiliar terms are used, it is because they represent unfamiliar concepts. But every attempt has also been made to introduce as few new concepts as possible, while still conveying an understanding of the power of the Instructional Quality Profile to help a teacher improve his or her instruction.

The few new terms/concepts that are introduced herein are extremely valuable for improving instruction. Therefore, it is highly recommended that you take the extra time to think through the

Figure 2

*The Six Questions of Instructional Quality Analyzed by the Instructional Quality Profile*



meaning of each. To facilitate this, those terms appear in bold-face type the first time they appear in this article and are defined both in the text and in a Glossary at the end of this article.

### Methods of Instruction

Methods of instruction can be conceptualized at many different levels of generality. Unfortunately, most methods have been conceptualized on too general a level, such as the discovery method versus the expository method. This is unfortunate, because two examples of the discovery method often differ in more ways than an example of the expository method differs from an example of the discovery method. After much careful thought and investigation, M.D. Merrill felt that the most useful conceptualization for our purposes would be to break down methods into their building blocks. Most of these building blocks, or **strategy components**, have reliable effects on student learning, unlike their more general counterparts.

The most important strategy components are instances, generalities, instance practice, and generality practice. They are called **presentation forms** to distinguish them from other kinds of strategy components.

- **Instance:** A single object, event, or symbol, such as a specific pen, a specific football game, or a specific letter of the alphabet. Instances may be examples of a concept, applications of a procedure, or explanations of a principle.
- **Generality:** A statement which applies to more than one instance, such as "a pen is an object which is used for writing with ink" or "a football game is any of several games played with an inflated leather ball. . . ." Generalities may be the definition of a concept, the statement of a procedure, or the statement of a principle.
- **Instance Practice:** A question or statement which requires the student either (a) to

remember an instance or (b) to apply a generality to an instance, such as (a) "describe the game you saw yesterday afternoon" or (b) "is this specific object (which you have never seen before) a pen, and why or why not?" Instance practice may require the student to classify something as to whether or not it is an example of a concept, performing an application of a procedure, or explain or predict an instance of a principle.

- **Generality Practice:** A question or statement which requires the student to recall or to recognize a generality, such as "what is the definition of a pen?"

Any piece of true instruction in cognitive subject matter can be classified as one (or several) of these four presentation forms. And each of these four types of presentation forms can in turn be analyzed as to its characteristics (a second level of strategy components). These characteristics determine a major part of the adequacy of a presentation.

### The Nature of Subject Matter

The Profile provides a unique understanding of the nature of subject matter as it relates to, and impacts upon, the whole question of instructional planning skills. There are two aspects of understanding the nature of a piece of subject matter: (1) the **content type** and (2) the **level of behavior** that the learner is expected to use with that content type (level of behavior is referred to as **task level**). These two aspects of all cognitive subject-matter content provide an extremely valuable tool for planning good instruction.

The Profile analyzes content as to four types: facts, concepts, procedures, and principles. It also analyzes tasks (student behavior) as to three basic levels: remembering an instance, remembering a generality, and using a generality. This means that any objective, any test item, and any piece of

Figure 3

The Profile's Task-Content Classification Table  
for Classifying Objectives, Test Items, and Instructional Presentations

TASK LEVEL	Use a Generality	Was the test you have just seen, used by Dr. A, an example of a formative evaluation?	How do you apply the steps for formative evaluation to Unit I of your English class?	How could the implementation of a formative evaluation for Unit I of your Biology class help the instructor?	
	Remember a Generality	What is formative evaluation? OR Define formative evaluation.	What are the steps in implementing a formative evaluation?	What are the major functions of formative evaluation? OR What is the rationale for formative evaluation?	
	Remember an Instance	What were the results your instructor got by using this test as a formative evaluation?	Is the test you have seen an example of formative evaluation? (Where the student was previously told that it is.)	What did your instructor do to have a formative evaluation of this unit? (Where this was previously explained.)	How did the implementation of a formative evaluation of this unit by your instructor help? (Where the student was previously told the answer.)
		Fact	Concept	Procedure	Principle
		CONTENT			

instruction can be classified as one of the task-content combinations shown in Figure 3. This task-content classification is extremely important for determining the quality of one's instruction, which is discussed next.

#### The Six Quality Questions

Ordinarily, a teacher would use the six quality questions (see Figure 2 above) in order, starting with number 1 (Are the objectives consistent with the purpose of the course?) and ending with number 6 (Are your instructional presentations adequate?). However, we believe that discussing the six questions in a different order will facilitate an understanding of the Instructional Quality Profile. Of the six quality questions, numbers 1, 3, and 5 are *consistency* questions: the purpose of a lesson, its objectives, its test items, and its instructional presentations should all be consistent with each other with respect to both task level and content type. The other three quality questions deal with the *adequacy* of objectives, test items, and instructional presentations. These six questions or aspects of instructional quality are briefly described below.

#### Purpose-Objective Consistency

The Instructional Quality Profile shows a teacher how to determine whether or not his or her objectives on a lesson are consistent with the purpose of the lesson, and it shows him or her how to correct any inconsistencies by eliminating, modifying, and/or adding objectives.

To determine whether or not one's objectives are consistent with the purpose of the lesson, the teacher must (1) *classify the purpose* as to task level according to a certain procedure (see next paragraph), (2) *classify each objective* as to task level by inspection, and (3) *compare the classification* of each objective with the classification of the purpose to see if they are the same. To correct any inconsistencies, the teacher must eliminate/modify/create objectives in such a manner as to make them consistent with the task level of the purpose of the course.

The most difficult part of this procedure is classifying the purpose of a lesson as to task level. This classification is based upon the *orientation* and *transfer requirements* of the lesson. Orientation refers to whether a lesson serves an application orientation or a memory orientation (i.e., a

Figure 4

*A Decision Table for Determining  
the Appropriate Task Level for the Objectives of a Lesson*

SELECTION CRITERIA		TASK LEVEL
Application Orientation	Transfer	Use a generality
	No Transfer	Remember an instance
Memory Orientation	Instance	
	Generality	Remember a generality

general education purpose) within a course. Transfer requirements refer to the degree of transfer required of the learner in post-instructional settings. For our purposes, no transfer and some transfer are the only two requirements of importance. Figure 4 indicates how to classify the purpose of a lesson as to task level on the basis of its orientation and transfer requirements.

**Test-Objective Consistency**

Once a teacher's objectives are consistent with the purpose of a lesson, the teacher can check to make sure that he or she is testing what he or she wants the students to know. In other words, are the test items at the same task-content level as the objectives? Our experience indicates that although objectives for a course are often at the use-a-generality level (e.g., When given a literary work, the student will be able to correctly identify whether or not it is a sonnet.), the test items are often at the remember-a-generality level (e.g., What is a sonnet?), or even at the remember-an-instance level (e.g., Is the following a sonnet? "Let me not . . . / . . . nor no man ever loved," where the student was told in a previous class that it is a sonnet.). The Profile shows a teacher how to determine the task-content combination of each test item and how to compare it with the task-content combination of its corresponding objective.

**Test-Presentation Consistency**

Once a teacher's test items are consistent with the objectives of the lesson, the teacher should make sure that he or she is providing the students with the kinds of information and practice that they need in order to attain that type of objective and to do that type of test item. In other words, is each instructional presentation consistent with the task level of its corresponding test item? (Content type is irrelevant to this consistency question.)

Sometimes instruction provides practice at a remember level (e.g., teaching the student to remember the generality about what mastery learning is) when the corresponding test items are at the use-a-generality level (e.g., How could you use formative evaluation in the course you are teaching?). Teachers often rationalize this by professing to teach students how to synthesize and apply what they have learned. This is an admirable goal; but if it is one of the teacher's goals, then it should be included in the objectives and it should be taught, complete with generalities, instances, and practice on how to synthesize and apply what was learned. Teachers may further rationalize that they want students to learn to discover for themselves how to synthesize and apply what they learned or how to solve problems. Again this is admirable if discovery is the *content* of the course, as opposed to the *method* used to teach another content. As a

Figure 5

TEST ITEM	PRESENTATION FORMS THAT SHOULD BE INCLUDED IN THE PRESENTATION		
USE A GENERALITY	GENERALITY	INSTANCE	INSTANCE PRACTICE
REMEMBER A GENERALITY	GENERALITY	GENERALITY PRACTICE	
REMEMBER AN INSTANCE	INSTANCE	INSTANCE PRACTICE	

*The Profile's test-presentation consistency table, showing which presentation forms should comprise an instructional presentation in order for it to be consistent with its test item(s).*

method of instruction, discovery is less efficient and probably less effective than generality-instance-practice instruction (probably less effective because if instructional time was equal for both, then retention and transfer would probably be higher for G-I-P instruction). If used as content, discovery must be an important part of the objectives; and it must be taught, complete with generalities, instances, and practice on how to discover effectively and efficiently.

The Profile takes an innovative approach to determining whether or not a presentation is consistent with its corresponding test item(s). First, the teacher must determine which presentation forms (generality, instance, generality practice, and/or instance practice) a presentation ought to contain. Figure 5 shows how this is determined. Then the teacher must analyze the presentation (e.g., the textbook or one's lecture notes) to determine whether or not the required, and only the required, presentation forms are actually present. In this manner, the teacher determines whether or not a presentation contains the necessary information for the student to learn how to perform as required by the test. As long as the test items are consistent with the objectives, there is little need to worry about the criticism of "teaching to a test,"

because in effect you are "teaching to the objectives" rather than to a test. Also note that this consistency question could be changed to read "objective-presentation consistency" with no substantive modification—merely substitute the word "objective" for "test item" in Figure 5.

The three quality aspects which deal with consistency are summarized in Figure 6.

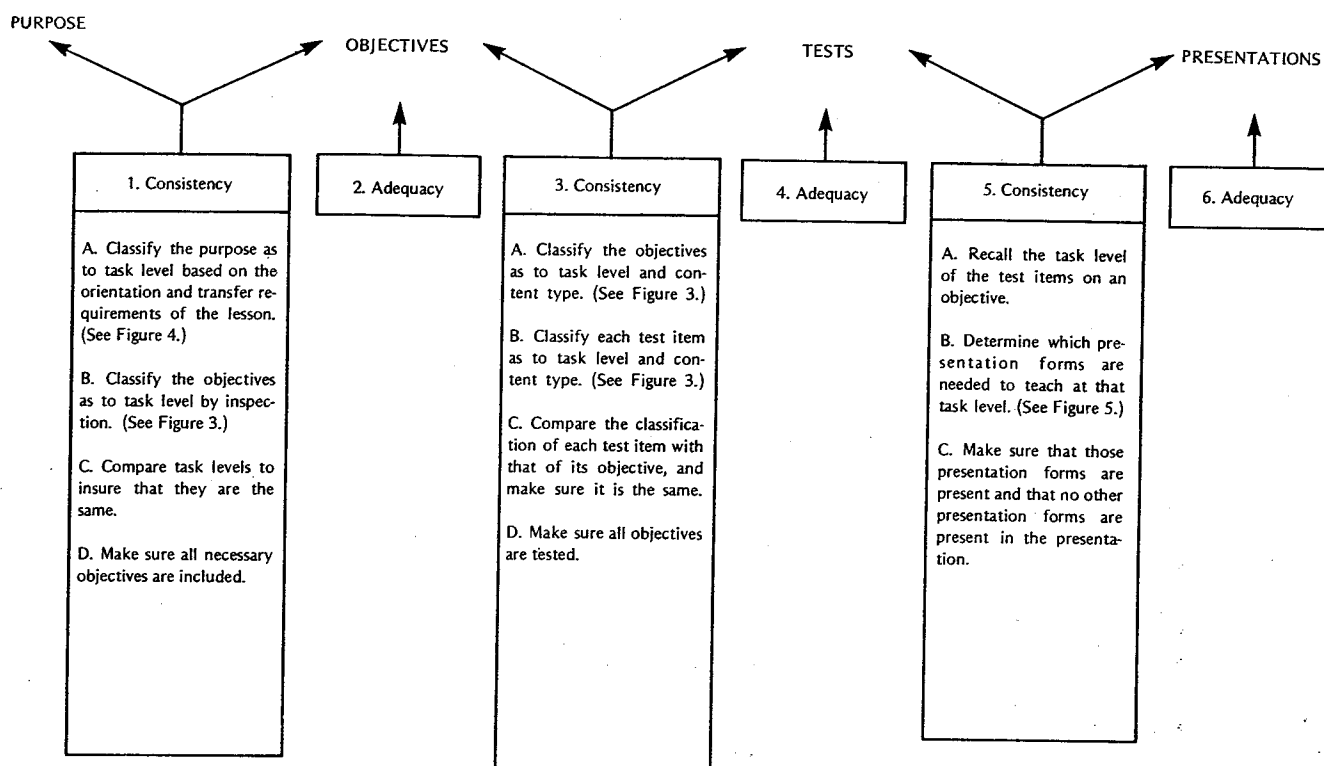
The next three quality aspects deal with adequacy rather than consistency.

#### Presentation Adequacy

Assuring that one is testing and teaching the right things is only one aspect of the quality of a teacher's instruction. You can teach the right content type at the right task level and still teach inadequately. Therefore, the Profile also helps teachers to identify the characteristics that should comprise each of the presentation forms that are appropriate for the task level of a presentation. The following is a list of such characteristics. Due to the scope and intent of this article, the characteristics listed below are not defined and illustrated (i.e., you receive no generalities and instances as examples). Rather, they are merely listed to indicate the nature of the principles of

Figure 6

Summary of Three of the Aspects of Instructional Quality  
Analyzed by the Instructional Quality Profile



instruction that underlie this aspect of the quality of instruction.

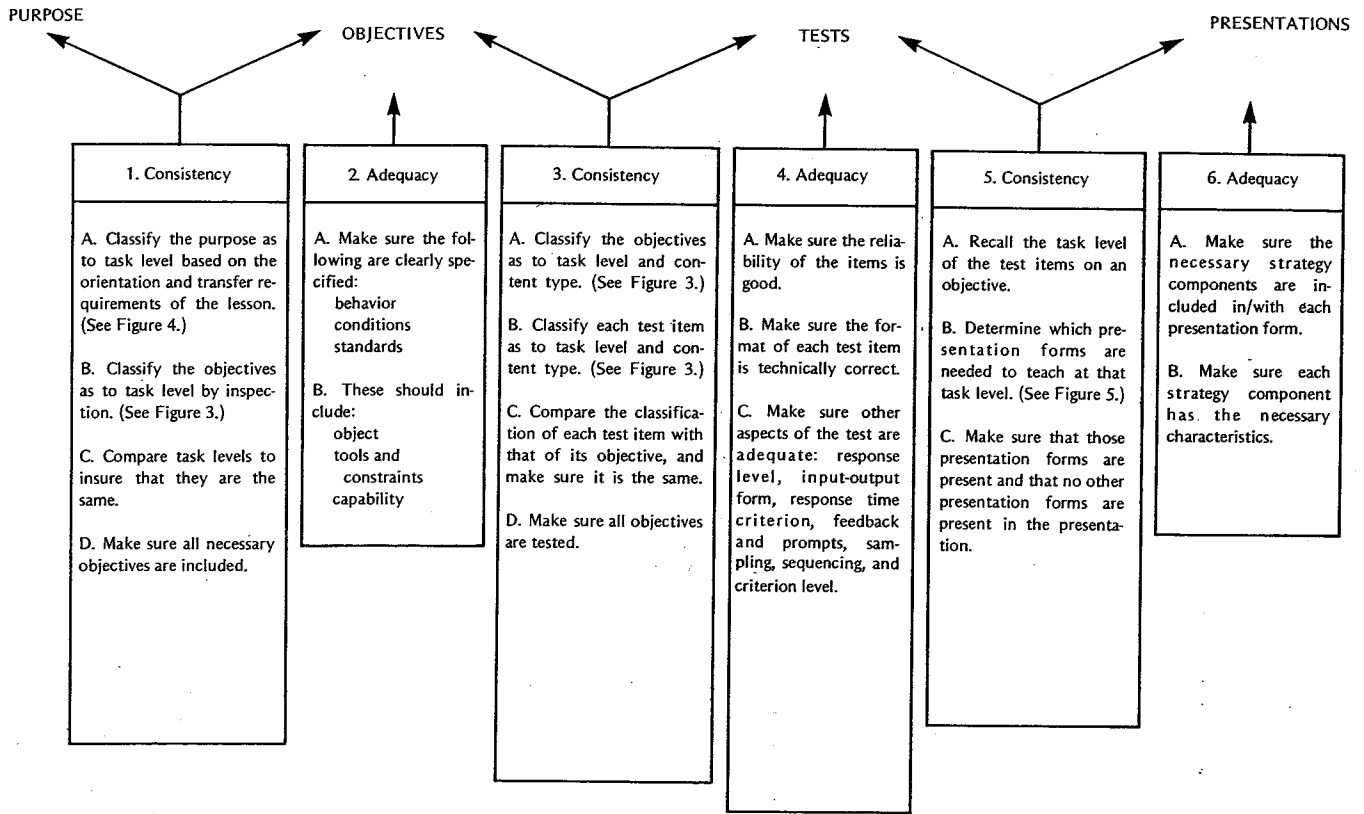
For instance, for the use-a-generality level, the *generality* (1) should be separated from the other displays in the presentation, (2) should be clearly labeled as a generality, and (3) should have a mnemonic and at least two different representations of the generality; the *instances* (1) should be separated, (2) should be clearly labeled, (3) should have "helps" (such as attention-focusing devices), (4) should have matched nonexamples, (5) should be divergent on variable attributes, and (6) should represent a range of difficulty, starting with the easiest instances; and the *instance practice* (1) should be separate, (2) should be clearly labeled, (3) should have separate feedback displays, (4) should have clearly labeled feedback displays, (5) should have no "helps" with the questions displays, (6) should have "helps" with the feedback displays, (7) should be randomly sequenced with respect to nonexamples, divergence, and difficulty, and (8) should represent a range of divergence and difficulty. (It is beyond the scope and intent of

this brief article to define and illustrate each of these strategy components and characteristics. They are described in greater detail elsewhere—see Merrill, Reigeluth, and Faust, 1979; Merrill, Richards, Schmidt, and Wood, 1977; and Merrill and Wood, 1974.)

The task-content table (see Figure 3 above) suggests that there are only ten kinds of presentations which can be written—one for each task-content combination. For each combination, there is a formula for designing a different kind of presentation, complete with all the aspects of presentation consistency and adequacy. Each task level (i.e., each row of the table) prescribes the inclusion of certain presentation forms (for consistency), and each task-content combination specifies the optimal strategy components, characteristics, and formats for each of those presentation forms (for adequacy). To design a high-quality presentation, it is only necessary for the teacher to determine the task-content combination which is desired, specify the subject-matter topic which is to be taught, and then complete the formula.

Figure 7

A Summary of the Six Aspects of Instructional Quality Analyzed by the Instructional Quality Profile



Test Adequacy

A teacher can test the right content at the right task level (the consistency criterion) and still test it inadequately. Therefore, the Profile helps teachers to identify the characteristics of good test items. Two important aspects of test adequacy have received considerable attention in the educational literature: (1) the reliability of a test item and (2) the technical correctness of the format of each test item. These are important aspects that a teacher should use to analyze the adequacy of his or her tests.

But there are several other aspects of test adequacy that have been largely overlooked or have received considerably less attention. Those aspects include the following. Unless otherwise justified, all test items (1) should require the student to *recall* rather than to recognize at the remember levels, and to *produce* rather than to identify at the use level; (2) should avoid providing internal prompts (clues within a test item), external prompts (clues provided by a different test item), or premature feedback (answers on some items

before all items have been completed); and (3) should be randomly sequenced throughout the test.

There are other test adequacy criteria which vary with the task level of the test item, such as (1) the nature of the information given to the student (e.g., a label, a generality, or an instance), (2) the nature of the information requested of the student, (3) the amount of time allowed for student responses, (4) the acceptable criterion with respect to student errors, and (5) whether or not a range of difficulty and divergence of test items is required. It is beyond the scope of this article to describe these test adequacy criteria. The important point is that the Profile shows teachers how to analyze these aspects of test adequacy.

The task-content table suggests that there are only ten kinds of test items which can be written—one for each task-content combination. For each combination, there is a formula for writing a different kind of test item, complete with all the aspects of objective-test consistency and test adequacy. To design a high-quality test, it is only





necessary for the teacher to determine the desired task-content combination, specify the subject-matter topic, and complete the formula.

### Objective Adequacy

Finally, since so many of the Profile's prescriptions are based on an analysis of the objectives for a lesson, it is important that each objective contain the characteristics necessary for analyzing it properly. The three most important characteristics that all objectives should have are: (1) the desired student *behavior*, (2) the *conditions* under which the behavior is to be performed, and (3) the *standards* for the acceptable performance of the behavior (Mager, 1962). The desired student behavior is essential for analyzing the task level of the objective, and the conditions and standards are important for aspects of test adequacy and presentation adequacy.

The task-content table suggests that there are only ten kinds of objectives which can be written—one for each task-content combination. For each combination, there is a formula for writing a different kind of objective, complete with all the aspects of objective consistency and adequacy. To design a high-quality set of objectives, it is only necessary for the teacher to determine the desired task-content combination, specify the subject-matter topic, and complete the formula.

### Conclusion

This description of the Instructional Quality Profile has been necessarily brief and inadequate. For a more thorough description of the six quality questions, the task-content table, and the strategy components of instructional methods, see Merrill, Reigeluth, and Faust (1979) or Merrill, Richards, Schmidt, and Wood (1977). For more information

about the ten formulas, write to the author of this article.

The Profile's six areas of instructional quality are summarized in Figure 7. The Profile is particularly effective at analyzing them, and therefore is especially valuable as a tool for teacher training in the area of instructional planning, for two major reasons: (1) it provides a unique understanding of *methods of instruction* by breaking them down into strategy components which have reliable effects on learning and (2) it provides a unique understanding of the *nature of subject matter*, including objectives and tests, as they relate to the six quality questions. (See Merrill, Reigeluth, and Faust, 1979 for a review of the considerable research support of the principles underlying the Profile.)

The Profile is ideally suited to training teachers in the area of instructional planning because of the balance of evaluation, diagnosis, and design skills that it provides. Teachers do not give instruction completely on their own; they almost always use some measure of prepared materials—objectives, textbooks, and even tests. The Instructional Quality Profile provides them with the skills necessary to diagnose the sources of the most important kinds of problems with those materials, and it gives them the necessary knowledge to correct those inadequacies by rewriting objectives and test items and by planning their own presentations (class lectures or discussions) accordingly. □

### Glossary

**Content type:** The kind of topic that is taught. It includes such kinds as facts, concepts, principles, and procedures.

**Generality:** A statement, such as a definition, which applies to more than one instance.

**Generality practice:** A question or statement which requires a student to recall or to recognize a generality.

**Instance:** A single specific object, event, or symbol. "A dog has four legs" is a generality, whereas "This dog has four legs" is an instance, because the latter refers to a *single, specific* object.

**Instance practice:** A question or statement which requires the student to do either of two things: (a) to remember an instance or (b) to apply a generality to an instance.

**Orientation:** Refers to whether a lesson serves an application orientation or a non-application orientation (i.e., a general education purpose) within a course.

**Presentation forms:** The different forms in which content can be presented. Four major presentation forms have been described in this article: generalities, instances, generality practice, and instance practice.

**Strategy component:** The smallest unit (or building block) into which it is helpful to analyze methods of instruction for purposes of prescribing (developing) optimal methods.

**Task level:** The level of behavior that the learner is to use with a given content type. It includes such levels as remembering an instance, remembering a generality, and using a generality.

**Task-content combination (or task-content level):** Both the task level and the content type.

**Transfer requirements:** The degree of transfer required of a learner. For determining purpose-objective consistency, it is the transfer requirements of post-instructional settings that is of importance.

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# Instructional Design as a Framework for Unifying Curriculum

Terry M. Wildman

One of the common characteristics of professional work in education—whether in general curriculum and instruction, the specific content areas, or educational psychology—is the tendency to treat complex educational problems in terms of single issues or in terms of component parts of the total problem or task. Issues of major educational journals are devoted to the "pieces" of curriculum and instruction, such as behavioral objectives, instructional strategy, evaluation, materials development, and miscellaneous prescriptions which have "worked" in one setting or another. This same trend is observed in the approach taken in most teacher training programs (preservice and inservice) where the general task of instruction is subdivided into many seemingly independent courses and experiences. As a result of this fractionation, the process of developing and understanding the major principles or frameworks which should direct and unify individual efforts in the development of curriculum and instruction is left largely untouched.

For several years now, I have been asking experienced teachers in my graduate courses to describe informally those belief structures or conceptual frameworks that guide their professional work in instructional development and teaching. The vast majority of these teachers do not have such a framework, and many voice skepticism at the suggestion that such a framework is possible. Of course, this situation is not surprising when one considers that the primary message to practitioners from the universities, journals, professional organizations, and, in fact, from professionals at all levels is to focus on the "pieces" of instruction and teaching.

The purpose of this article is to argue for more emphasis on the fabric which holds curricular detail together as well as to describe those conceptual tools which may prove helpful in redirecting our thinking toward holistic approaches. I will begin by examining first the nature of recent

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