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ABSTRACT

The purpose of this paper is to introduce a systematic teaching approach known as the General Teaching Model for instructing college students in reading. The model consists of identifying appropriate objectives for the student, pre-assessment prior to beginning instruction, instructional procedures designed to help the learner achieve the objectives, and evaluation. Examples of instructional objectives for reading and an example of individualizing reading using Computer Assisted Instruction as a special case of the more general teaching model are presented. (WR)

A Systematic Approach and the Use of Instructional Objectives As An Aid In Teaching

Isadore Newman

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A Systematic Approach and the Use of Instructional Objectives As An Aid In Teaching

The major purpose of this paper is to introduce a systematic teaching approach known as the General Teaching Model (GTM). If used intelligently, this model will be a significant help in improving one's teaching effectiveness. The model will first be introduced and its components will be briefly explained.

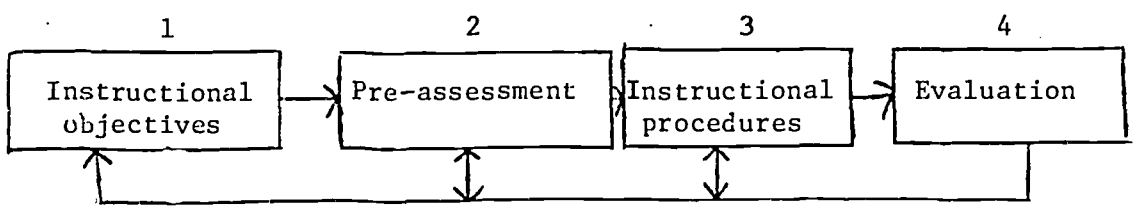
Examples of instructional objectives for reading will be given since they are the basis of any systematic approach to instruction and the General Teaching Model.

An example of individualizing reading using Computer Assisted Instruction as a special case of the more general teaching model will be presented.

The basic underlying assumption of the General Teaching Model is that it is desirable to maximize the efficiency of instruction so that the student will learn what is desired for him to learn in the most effective manner. This model uses evaluations to help decide on the needed change and modification in instruction to help the student learn and help the teacher decide if he has been "successful".

A decision must be made as to what learning is to occur, what strategy is to be employed to bring it about, and as to what is the most effective manner of evaluating it.

A Diagram for this Model and brief description of its components is given below.



1. Instructional Objectives. Instructional objectives are first identified by the teacher and/or students and selected on the basis of an analysis of desired learning outcomes and then specified in such a manner that it can be measured operationally.

2. a) Pre-Assessment. Prior to beginning instruction, learners are pre-assessed to determine whether they possess the prerequisite knowledge and skill to begin instruction, or whether they have already mastered some of the instructional objectives.

3. Instructional Procedures. Instructional activities are designed to help learners efficiently achieve the specified objectives. Instructional principles, such as motivation, practice, graduated sequence, feedback, etc., with which the instructor employs various instructional methods (e.g., lecture, discussion, independent study), are employed in the design and implementation of instruction. (This component will not be dealt with in this paper).

4. Evaluation. Instruction is evaluated for efficiency in getting as many students as possible to master as many objectives as possible. Based on the results of an evaluation, modifications are made in the objectives, pre-assessment, and/or instructional procedures, as needed to further maximize instructional efficiency.

The one most important step is deciding on the objectives (goals). This process includes possible negotiation with students of their need assessments prior to finalization of instructional objectives. This would necessitate some flexibility in teacher-student dialogue early in a course to arrive at mutually agreeable objectives; but this process, if undertaken, would negate any objection that students were being treated merely as "objects". This may be a useful means of involving the college student and it could yield positive by-products. For example a student with reading problems tends to have a low self-concept. Having him state his goals and help determine the best approach to achieve these goals may help him realize his worth, increase his committment, and motivation.

The first step that should be taken is to decide an appropriate objectives for the student. This can only be accomplished by some type of diagnostic testing or evaluation. Since we are concerned with the problem area of reading,

the skills can be divided into two broad categories; decoding and communication. "Decoding is the rapid, if not automatic association of phonemes or phoneme groups with their respective graphic representations. Communication involves reading for meaning, aesthetic enjoyment, emphasis, and the like." (Atkinson, 1974).

Possibly, a more helpful classification for producing a reading diagnostic test would be subdividing skills into five categories: sight words (memorized), context words (fill-in-the-blank using context clues for meaning), phonemes and phonics, structural analysis (root words, prefixes and suffixes), and dictionary skills.

To develop items for sight words, approximately twenty or thirty can be randomly selected from a larger list of sight words that one would expect the student to have at his command. The cloze technique can be a useful procedure to determine a student ability to comprehend meaning. Phonics can be simply tested by having the student read vowels and consonent sound while an instructor checks his accuracy. The same types of procedures can be used to test the student's knowledge of roots, prefixes and suffixes, and dictionary skills can be determined by completing a variety of exercises such as locating words, using diacritical markings, etc.

If you are going to develop your own diagnostic test, it should be tried on both students who are reading at a level you are comfortable with, and on students who have been identified as having reading problems, to see how well the test descriminates. (Along with this known group validity procedure, one should also get estimates of reliability.) An education psychologist or psychometrician could certainly be helpful in this area. (If you don't know any, you can contact me since I am both.) However, there are tests on the market that already do much of this. One such test is "Basic English Diagnostic Test or Pre-test," Computer Curriculum Corporation, 1970.

Based on the diagnostic results, one can then re-evaluate the original goals and establish more specific instructional objectives to meet the assessed needs. The finalized objectives can then be used to determine the most effective teaching procedures for accomplishing the teaching task. These procedures may vary, including such things as group work, out of class assignments, programmed texts, computer assisted instruction, and a variety of other individualized procedures.

The evaluation is the final part of the model and only through it can you determine your degree of success. It is also a learning procedure for the instructor since it yields information on which teaching procedures have been most effective and which need to be revamped. It is really only through an evaluation procedure that one can get an objective look at how to modify and improve his instruction. It is the basis on which the scientific method of self correction is founded.

Your evaluation instrument can be the pre-test instrument given at the end of instruction, but it is generally a good idea, for a variety of reasons, not to use the same items. In addition to this, personal interviews with the student may be helpful in ascertaining the strengths and weaknesses of the instructional procedures.

Examples of Instructional Objectives

Once the students needs are properly assessed, it should be the primary function of the instructor to formulate objectives that will meet these needs. The objectives can be written for both the cognitive and affective domains.

In the cognitive domain one may think of two broad subgroups:

1. Learning that requires only memory.
2. Learning that requires more than memory such as application and evaluating, etc. The easiest category to write behavioral objective for is memory. When we get to application, the behavior that needs to be specified and measured becomes a little more difficult, and when we get to behaviors that require the student to evaluate, writing of behavioral objectives becomes much more difficult. An example of such an objective is given below.

The affective domain deals with the attitudes and feelings one wishes to produce and measure.

Each objective should clearly state the conditions, the desired behavior and the criterion for acceptance. These are Mager's three elements that should be considered when writing a good behavioral objective.

1. Conditions: a description of the class of stimuli to which the student is to respond (e.g., the type of questions, tasks, or problems, and the form in which they will be presented, the relevant conditions under which the student will be expected to perform--materials or equipment which will be available, environmental conditions which may affect the performance, special physical or psychological demands which may exist).

2. Behavior: a statement containing an action or behavioral verb which connotes or denotes the behavior the student is to perform (e.g., identify, write, describe, solve, classify) and a general reference to the product of the student's behavior (e.g., an essay, a diagram, a three-dimensional model).

3. Criteria: a description of the success criteria by which the student's behavior is to be judged acceptable or unacceptable (e.g., correctly applies three principles, identifies 8 out of 10, solves the problem, the idea must be different from any in the textbook, discussed in class, or produced by other students).

The next few examples are instructional objectives that need revision in order to meet Magers criteria. The objectives will be presented, along with an explanation of where they are inadequate and finally, they will be rewritten to serve as examples for good objectives.

The first example is at the knowledge level since it only requires memorization (recognition). It is:

1. The ability to recognize the meaning of words.

This does not specify if the student will perform this as a verbal or written task, whether these words will be part of a multiple choice, true or false or matching test, or whether the meaning is to be derived from context clues. We also don't know if he will be allowed to use a thesaurus or dictionary

or the level of difficulty of the words. In other words the conditions are not specified very well.

The behavior recognition is specified.

The third aspect, criteria, is crucial for evaluating your success. As the objective is now stated one does not know how many words and at what level must be properly recognized before one is satisfied that the objective has been met.

An example of a more precise way of stating this objective is:

1a. From the list of words used to prepare the College Board Examination, the student will be able to recognize 80% of the words correctly, when given a multiple choice test.

This objective tells the student where the items will come from, the level of difficulty, how many he must get right and how he will be tested. This information helps facilitate his studying and makes him a more efficient learner. It eleminates the game of "let's out guess the instructor."

A second example is at the higher than knowledge level. It is:

2. The ability to recognize and draw inferences which are not specifically stated.

Again the conditions have not been stated and we don't know the level of difficulty of the reading material, whether the student is to do this with a paragraph, an artical or book, nor do we know if there is a time limitation etc.

The behavior's recognizing and drawing inferences have been stated.

The criteria again has not been mentioned. How will the instructor measure these behaviors and determine if the objective has been satisfied? By not stating that the student is less likely to study appropriately since he does not know how he will be evaluated, and the instructor also has a difficult problem since

she has not established for herself a clear means of differentiating between satisfactory and unsatisfactory responses. An example of a clearer way of stating this objective would be:

2a. After reading The Plague by Albert Camus, the student will be able to recognize three philosophical inferences and support them by relating quotes from the book to existentialist philosophical positions.

This tells the student the book he must read, that he should be looking for philosophical overtones and that he should be familiar with existintialism.

Another variation of the same objective might be:

2b. Given ten quotes from Albert Camus, The Plague, the student will be able to match them with the correct existentialist positions 80% of the time.

At this point, you should be able to read objective 2b and state the conditions, behavior and criteria with 100% accuracy.

(Answer: condition - Ten quotes from Camus' The Plague
behavior-matching quotes to existential philosophy
criterion-80% accuracy)

Some of the most important claimed benefits of using behavioral objectives are stated by Miles and Robinson (1971):

1. facilitate instructional design and development by providing clear goals to work toward.

2. facilitate curriculum writing--sequencing, eliminating gaps and overlaps.

3. promote more efficient communication between teachers, administrators, researchers, students, parents.

4. make evident what students actually learn, thereby permitting selection of most important goals.

5. permit instruction to be evaluated.

6. promote individualized instruction by making possible criterion-referenced evaluation--each student can be required to master all objectives. (Independent learning is also promoted.)

7. permit students to be more efficient learners, when they find out what is expected of them.

8. eliminate the time wasted when students can already achieve all or some objectives before beginning a course (proficiency and advanced placement exams.)

9. tend to impose a philosophy of teacher responsibility for getting students to master objectives.

Two Asserted Problems with Behavioral Objectives

First, writing defensible objectives is a very time consuming and difficult task. For this reason the behavioral objectives exchange center was developed. This center has collected objectives for all areas of study and they will send the objectives to you. Below is an address to write to:

Behavioral Objective Exchange Center
Center for Advanced Study in the Behavioral Science
202 Junipero Serra Boulevard
Standford, California 94305

Second, there have also been straw men built to show why behavioral objectives are not defensible. An example of one of these is, "If you write behavioral objectives for your students all of the time you are identifying what is important for them to know. Many people assert that the problem with behavioral objectives is that the behavioral objectives may become a crutch to the students so that they will not be able to identify important concepts for themselves." This criticism is very easily handled by writing an objective stating: "The student, given certain material, will be able to identify and state the defining characteristics of important concepts in the subject under study," In other words, a behavioral objective can be written to take care of such criticisms.

And third, the student, typically, becomes merely an object. The object of the teacher's aims. His role in the decision making is passive. He responds to programmed stimuli, Because of this aspect of behavioral instruction, some leading educators are concerned that the student may lose whatever self-initiative he may have had. They regard this as a serious and unanswered deficiency. Perhaps, as we learn more about behaviorism these problems will disappear.

As discussed earlier when explaining the G.T.M. model, instructional objectives can and should be written so that they consider the student's needs.

If this is done, the student can not legitimately be considered as merely an "object." Since within the procedure for deciding on instructional objectives, the student can play an integral role.

An Example of Teaching Reading Using Computer Assisted Instruction (CAI)

Computer Assisted Instruction (C.A.I.), is probably one of the most sophisticated procedures for individualizing instruction, but at this time it is quite expensive. Atkinson (1974) presents a description of C.A.I. used to assist in teaching a reading curriculum.

The particular C.A.I. setup involved consists of a typewriten terminal with supplementary earphones and an amplifier. It is a relatively low cost unit compared to some of the more sophisticated C.A.I. equipment.

The reading curriculum was developed for students in grades 1 - 3 and catagories called strands. Instruction begins at Strand 0 which assumes absolutely no information but teaches the student how to interact with the computer and its program. Strand 1 is letter identification, Strand 2 - sight word recognition, Strand 3 - spelling patterns, Strand 4 - phonics, Strand 5 - spelling, Strand 6 - word comprehension, and Strand 7 - sentence comprehension.

The student progresses through several strands simultaneously. He may be working with sight words, phonics and spelling patterns at the same time. His advancement is contingent upon earlier performance which is continually being reevaluated. In other words, if one recalls the General Teaching Model, at each stage there is a certain objective on which the student is pretested. If he knows that objective he is advanced to the next sequential objective. If he doesn't, he is given instruction at that level and then tested again (evaluated) to see if he has achieved mastery. If he has, he goes on, if not a decision based on pre-established criteria is made at htis point. The student may be branched to a remedial program, given more examples on the same level, etc.

As one can see, from Atkinson's schematic, Figure 1, this is really a special case of elaboration on the General Teaching Model. At first glance Figure 1 appears to be quite complicated. However, after looking more closely it becomes apparent that the schematic is detailing the specific aspects of the General Teaching Model, and it can be more easily understood when this is kept in mind.

Another example from ATkinson, Table 1, shows how Strand 2 - sight word recognition is taught.

TABLE 1

Examples of Two Exercises Used in Strand II (Sight-Word Recognition)

	Teletypewriter display	Audio message
Copy exercise		
The program outputs:	PEN	(Type pen.)
The student responds by typing:	PEN	
The program outputs:	+	(Great!)
The program outputs:	EGG	(Type egg.)
The student responds by typing:	EFF	
The program outputs:	////EGG	(No, egg.)
Recognition exercise		
The program outputs:	PEN NET EGG	(Type pen.)
The student responds by typing:	PEN	
The program outputs:	+	
The program outputs:	PEN EGG NET	(Type net.)
The student responds by typing:	NET	
The program outputs:	+	(Fabulous!)

Note. The top panel displays the copy exercise and the bottom panel the recognition exercise. Rows in the table correspond to successive lines on the teletypewriter printout.

Even though this program is more remedial than one would need for college level instruction, there are programs that have been or are in the process of being developed for higher level curriculum. (See Computer Assisted Instruction, ed. Isadore Newman, pp. 1-7, 131-132 for an annotated bibliography on the use of Computers for teaching reading).

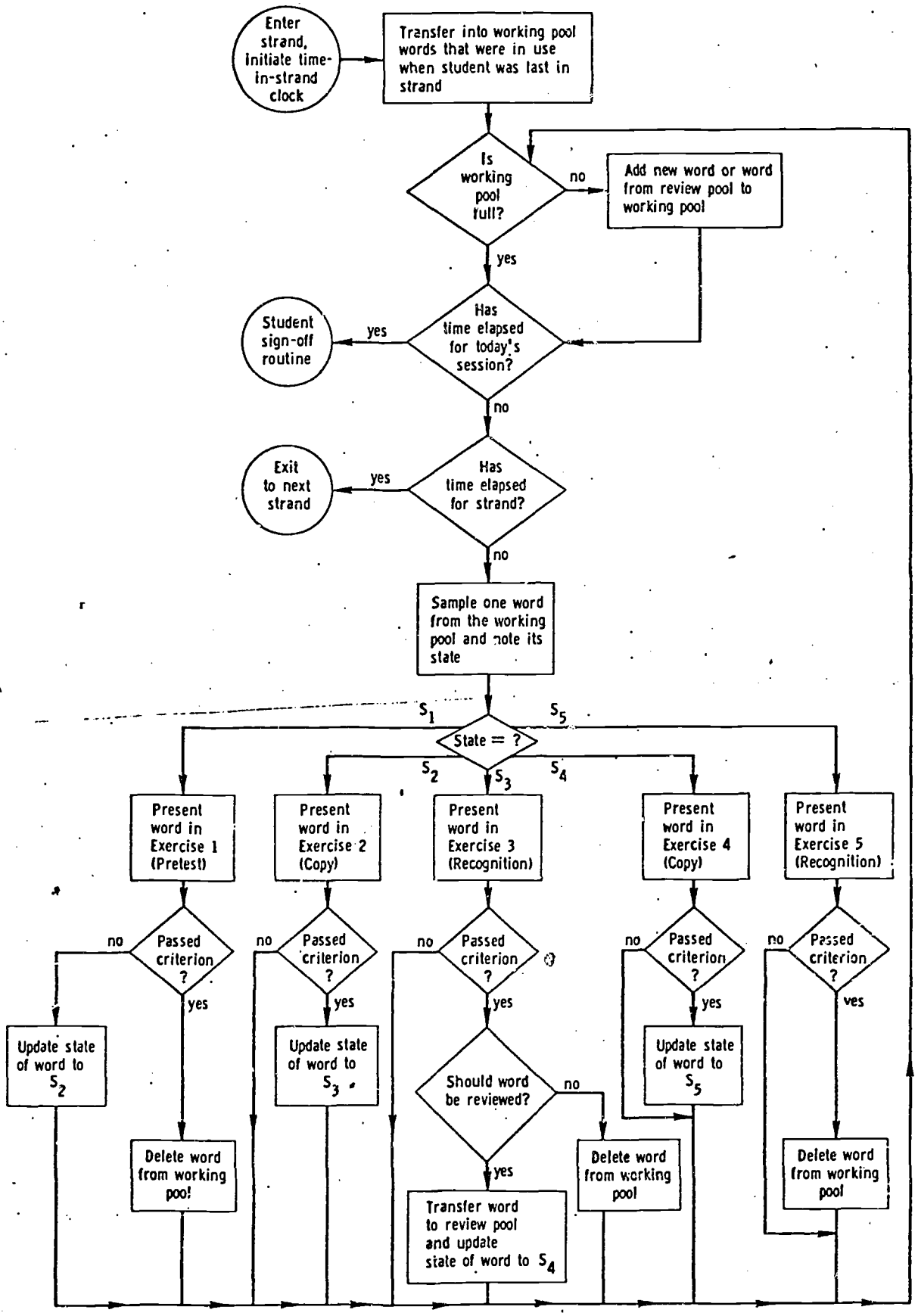


Figure 1 - From Atkinson, 1974

It should also be noted that the research has indicated that using computers is an effective procedure for teaching certain types of skills, while classroom teaching is more effective for other types of skills. There is very little empirical research that has compared the effectiveness of the individualization procedures of C.A.I. to other individualized teaching procedures. Therefore, the final results on which is the most efficient teaching procedure for the variety of skills, are not in as of yet. Alternative methods for individualization that do not use computers, are presented in a paper by Nobel and Newman (1974).

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