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ABSTRACT

This paper proposes a plan for teaching young children in a systematic diagnostic manner. A sequence of steps is described which includes: (1) diagnosis, through the use of formal and informal tests and classroom observation; (2) choosing specific objectives that have relevance to the individual child and are measurable or observable; (3) planning instruction including determination of the modes to be used and the amount and kind of structure to be imposed on the learning experience; (4) selecting good, appropriate materials according to certain general and specific features; (5) carrying out instruction; and (6) evaluating the success of decisions the teacher has made. Charts which illustrate this systematic-diagnostic sequence of teaching activities are included as are some sample behavioral and cognitive objectives. (Author/ED)

An Organizational Sequence for Teaching

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Abstract

This paper proposes a plan for teaching in a diagnostic and systematic manner. A sequence of steps is described which includes diagnosis, choosing specific objectives, planning instruction, choosing materials, carrying out instruction and evaluation. By proceeding in an organized fashion the teacher can achieve greater satisfaction for herself and her students through obtaining evidence of specific learning on the part of both.

An Organizational Sequence for Teaching

A current trend is to encourage teachers to be systematic and organized in their approach to teaching (e.g., Nimnicht, 1970 and Kaufman, 1972) and to take a diagnostic approach (e.g., Bauer, 1971; Gordon, 1968; Hayes and Dembo, 1971; Hodges, et al., 1971; Hunter, 1972; Myers, et al., 1973; Ott, et al., 1970; and West, 1971). A systematic approach is one which follows a specific set of steps. A diagnostic approach is one which finds out what the learner knows before beginning the teaching process. Instruction is designed after assessment is made of the learner's developmental level and after instruction assessment is again made to determine if learning has taken place before moving on to the next step. Figure 1 depicts a flow chart of the steps the teacher would take in teaching. The following is a description of each of the steps in the teaching process as depicted in the chart.

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Insert Figure 1 about here

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General Objectives for the Young Learner

The overall general objective for the young child are to gain mastery of the specific cognitive, affective and psychomotor concepts and skills which will enable him to be a competent human being and a competent learner. The cognitive area includes language skills, mathematical skills and concepts, problem solving abilities, etc. Affective objectives involve social competence, emotional well being, self concept, and attitudes toward learning. Specific areas for psychomotor learning are those involving large and small muscle skills and perceptual skills such as auditory and visual discrimination, memory and generalization. These are the broad areas for initial

diagnosis. From the results of this initial diagnosis specific instructional objectives can be formulated.

Diagnosis

Diagnosis consists of questioning and/or observing each child to determine in which concepts and skills he is already competent and in which he needs instruction. This diagnosis can be done using formal tests, informal tests and classroom observation. Through observation the teacher can note which kinds of materials suit each child best. She can also determine which mode of instruction is most suitable: working alone, with another child, individually with a teacher, with a small group of children or with a small group of children guided by a teacher. She can also discern whether the child is motivated more strongly by intrinsic, social or concrete reinforcement. Observation is also a prime method for making diagnosis of social competence and emotional state.

Testing done with a total class is most unsatisfactory with young[1] children. Even those at primary levels may have difficulty with the type of paper and pencil activity which is used. The child's competence level in the concepts being tested may become confounded with perceptual-motor skills. For instance, the child who has difficulty getting his pencil to the correct answer and making a mark may come up with a deceivingly low score. The one-to-one interview is the most satisfactory method. However, information can also be obtained by one adult with a small group (4-8) of children. In a well organized classroom where children can be working alone or with each other; by enlisting the help of parents as teacher aides; and/or teaming with other teachers to combine classes it is possible to arrange a schedule which allows for individual and/or small group interviews.

Some examples of individually administered formal tests for diagnosis are

the Concept Inventory (Engelmann, 1967), The Preschool Inventory (Caldwell, 1967), the Boehm Test of Basic Concepts (Boehm, 1972), and the Cognitive Skills Assessment Battery (Boehm and Slater, 1974).[2] Any of these can be administered by carefully trained teachers, teacher aides or parents. The Concept Inventory is mainly a measure of receptive language. The other tests cover more areas including language, number, classificatory concepts, and social and perceptual-motor skills and concepts. The teacher can also make up her own test battery using her own ideas and/or a guide such as that developed by Hannum and Bratten (1975). Hannum and Bratten (1975) have developed instructions for a teacher-made assessment kit which can be used with children five years through primary age. It includes assessment tasks in all the basic cognitive and psychomotor areas except mathematics (this section is still being developed). The advantage of this type of diagnostic instrument is the low cost, convenience and ease of adding additional items as needed (each task is filed on a 5" x 8" card). Convenience and flexibility are achieved by being able to easily pull out only the cards needed for a particular assessment interview.

Individual Instructional Objectives

Most early childhood programs have lists of objectives. Unfortunately these objectives are often too general to be of practical value in planning instruction. Once there is information on each child's specific strengths and weakness more specific objectives which fit where he is in the developmental sequence can be devised or chosen. Then instruction can be planned and materials decided upon. A very specific type of objective is the behavioral or performance objective. Many educators feel that this type of objective is too narrow and stifling (Hess and Croft, 1972) but actually performance objectives can be very valuable in that they force teachers to choose specific

goals and they include a measurable outcome. Too often, as mentioned, objectives are too broad and cannot be measured. For instance, a teacher might have the objective "To give the child skill in language competence." This objective is broad and non-specific in that no indication is given as to what behaviors by the child might indicate language competence. In contrast are the following examples of behavioral (performance) objectives which might be appropriate in the area of language competence for four-year-olds (Hess and Croft, 1972, p. 318):

1. As the teacher names three objects shown in a picture, the child will be able to point to each in turn without error; for two of them he will tell something about their use or characteristics (examples: tricycle, door, teacher).
2. Upon being shown ten different objects (or pictures of them) the child will be able to articulate the names of eight.
3. When asked three questions such as the following examples, the child will be able to answer all of them using standard verb forms for bring, run and see.
   a. "What did your teacher bring to school today?"
   b. "How far did the dog run?"
   c. "Which did you and your friend see--an airplane or a helicopter?"
4. To a small group of listeners the child will be able to repeat from memory a nursery rhyme or verse containing at least three lines.

According to Hess and Croft (1972, p. 318) the advantage of behavioral objectives is their specificity: they state exactly what the learner is supposed to do; in what context; and give a standard of achievement for acceptable performance. To illustrate this point they present some objectives in a tabular form (p. 320). Figure 2 includes three examples from this table.

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Insert Figure 2 about here

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Objectives are fairly easy to devise in academic areas. However, the teacher's task is made even easier because objectives can also be chosen from

those already devised because more and more commercial programs and groups are publishing performance objectives. For example in their Readiness Level the Addison-Wesley Math Program has objectives such as: Given two objects of clearly different sizes, the student can identify the larger and/or smaller object; Given two sets of objects, the student can identify the set that has more or less (fewer); Given a set of 0-9 objects, the student can name a cardinal number of the set by counting. (p. 4 of A guide for individualizing elementary school mathematics and school mathematics, 1972) The Michigan Department of Education has a list of Recommended Minimal Pupil Performance Objectives for Preprimary Educational Programs (1973) and the Instructional Objectives Exchange collects and disseminates objectives in all three concept areas (Early Childhood Education, 1974). The teacher will have to take care in choosing objectives so that they fit the child she intends them for. She may also have to modify objectives to better fit them to a particular child (such as devising sub-objectives which divide the objective into smaller learning segments for the slower child).

Objectives can of course be specific without being stated in behavioral or performance terms. For instance, Nimnicht (1970) presents some examples of specific objectives which are not performance based. He states his objectives strictly in a descriptive manner as to areas of learning. He sets up what he calls a "Chart of Objectives" (Nimnicht, 1970, p. 13). Each chart is set up as in the example in Figure 3. This type of chart does focus the

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Insert Figure 3 about here

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teacher's attention on specific concepts to be learned but it gives no clue as to what kinds of child behaviors will demonstrate mastery of the concept. It

is here that performance objectives are highly valuable in that the teacher knows exactly what kinds of behaviors will indicate that the objective has been achieved. It is this built in evaluation factor along with specificity which makes behavioral objectives of great value in teaching specific skills and knowledge.

On the other hand, in some affective areas and in cognitive areas which involve discovery and inquiry where there is no one "right" answer or "correct" performance a less specific objective may be more appropriate. For example, "acquiring a problem-solving attitude" might involve a number of observable and unobservable behaviors which would vary from child to child. The same might be said for "being a good citizen," "having a positive attitude toward peers," etc.

Planning Instruction

Planning instruction involves decisions as to the modes to be used and the amount and kind of structure to be imposed on the learning experience. Instructional modes can be large group presentations, small group activities (4-8 children), one-to-one or individual activities. The groups can either be teacher directed or child directed and can be formally or informally constituted. A formal group would be one that the teacher constitutes; an informal group one that the children constitute by just having similar interests or being in the same place at the same time by chance. Small group activities are very important for both social and intellectual learning. Gordon (1968, p. 9) in discussing a Piagetian approach to instructional design, says, "...the tasks need to be designed so there are group activities in them. There must be a good deal of interaction and free exploration." There should be child-child, teacher-children small groups and children-without-teacher groups. Children can learn to decenter (learn to recognize other

points of view) through encounters with each other in which they have opportunities to disagree" (Gordon, 1968, p. 9).

The amount and kind of structure to be imposed on learning experiences is of course one of the most controversial questions in early childhood education. For instance, consider the area of language instruction. Moore (1971), discussing strategies for teaching language, divides teaching situations into three general types: "free-play situations with informal emphasis on verbal skills; training situations where the teacher's response is contingent on the child's; and training situations in which the child's response is made contingent on the teacher's" (p. 38). In the first situation the teacher is a passive recipient of the child's overtures. In the second type of situation the teacher elicits spontaneous responses from the child and then expands on them. In the third type of situation the teacher is in control and elicits very specific predetermined types of responses from the children.

The question of structure has not been completely answered but some didactic small group instruction does seem to be a necessity, especially for children who have difficulty communicating successfully in the school situation. A situation has to be organized so that there are opportunities for rote learning and repetition, for creative, abstract thinking and for exploration and problem solving.

Selection of Materials

With objectives chosen and the instructional strategy designed, materials can then be chosen. Two aspects must be considered in choosing materials: the general features of good materials for young children and choosing from what is available in a particular content area. Materials for children should be of good quality so that the children can use them independently without

direct supervision. Materials which must always be put away after a didactic lesson have limited value. This consideration is very important when considering the purchase of "programs" or kits of materials. To keep the price reasonable the materials are very often quite poorly constructed. Comparable materials of better quality purchased over a longer period of time will often turn out to be a much wiser and more economical investment. Materials should also be chosen that fit the children. One of the dangers in adopting a "total" program is that it may not fit the diagnosed learning needs of the children. There has often been emphasis on choosing materials first and then finding out what the children need (Weinthaler and Rotberg, 1970). Weinthaler and Rotberg suggest that "...the first step is to establish a general framework of group learning abilities as a basis for selecting a master materials library" (p. 616). They then outline what they feel are the basic areas of learning and under each area list the kinds of materials needed. If a teacher has in mind the concepts and skills to be taught and has on hand appropriate basic materials she can then avoid the trap of being bound to one commercially developed program. This way a truly diagnostic (and thus individualized) program can be executed.

Carry Out Instructional Plans

If the previous steps in the sequence have been carefully executed this part should run smoothly. Most of the children will be provided with appropriate experiences to move them ahead in the sequence of learning and development. For some children incorrect decisions will have been made which may not show up while they are involved in the learning experiences or which may not show up until the final evaluation is made. In any case the sequence chart takes this eventuality into consideration. A decision must be made as to whether to reteach or rediagnose.

Evaluation

Evaluation is the step which follows the instructional period. An instructional period may be a few seconds during a teacher directed lesson, several days spent working with some specific materials, or any other period of time depending on what seems to be a reasonable length of time for attaining a particular objective. Many times it is not necessary to get to the end of the lesson to realize it is too easy, too hard or otherwise inappropriate. Therefore, informal evaluation should be going on all the time, not just at some prescribed time in the sequence of learning activities. If objectives have been formulated in a performance manner the evaluation task is of course built in. If the student has mastered the objective he can go on to the next step and/or he can engage in assimilation activities. Assimilation is a more satisfactory term than enrichment which is usually attached to activities for the more capable children only. Assimilation activities are necessary for all children. According to Gordon (1968) time must be allowed not only for accommodation (incorporating new concepts) but also for assimilation (using concepts in various problem situations). Accommodation allows for vertical movement; assimilation for horizontal movement (Gordon, 1968, p. 8). Assimilation activities are parallel activities which allow for generalization experiences. That is, there should not be just "one shot" learning. "One of the things we know about children is that they can stay with a task of high interest to them long after an adult is thoroughly bored with it" (Gordon, 1968, p. 8). If the student has not mastered the objective additional teaching can be done and a re-evaluation made. If the objective is then mastered the student may go on to the next sequence. If he still has not achieved mastery then the objective should be

reconsidered. This might involve breaking the task down into smaller steps or it might involve a re-diagnosis asking some different questions which delve deeper or go back a step or two. In either case new objectives are formulated before proceeding any further.

SUMMARY[3]

Teaching has been described as a diagnostic, systematic activity which follows a sequence of steps:

1. The teacher has available the universe of areas from which objectives can be devised or chosen for the child.
2. Each child is diagnosed for achievement level, learning style, and motivational level.
3. Specific instructional objectives are devised or chosen for each child on the basis of the diagnosis.
4. Instruction is planned.
5. Materials are chosen.
6. The instructional plans are implemented.
7. Learning is evaluated and the learner either goes on to the next sequence and is also given assimilation activities or the concept is retaught and re-evaluated. After re-evaaluation the student may go on to the next sequence and be given assimilation activities or the objectives may be reconsidered and a new diagnosis made.

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Footnotes

1. Eight and under.

2. For an evaluation of the first three tests see Preschool/Kindergarten Test Evaluations. School Evaluation Project, Center for the Study of Evaluation, UCLA Graduate School of Education, Los Angeles, California, 1971.

3. For an excellent depiction of the diagnostic approach in action see the film Creative Kindergarten, Soundings, 1971.

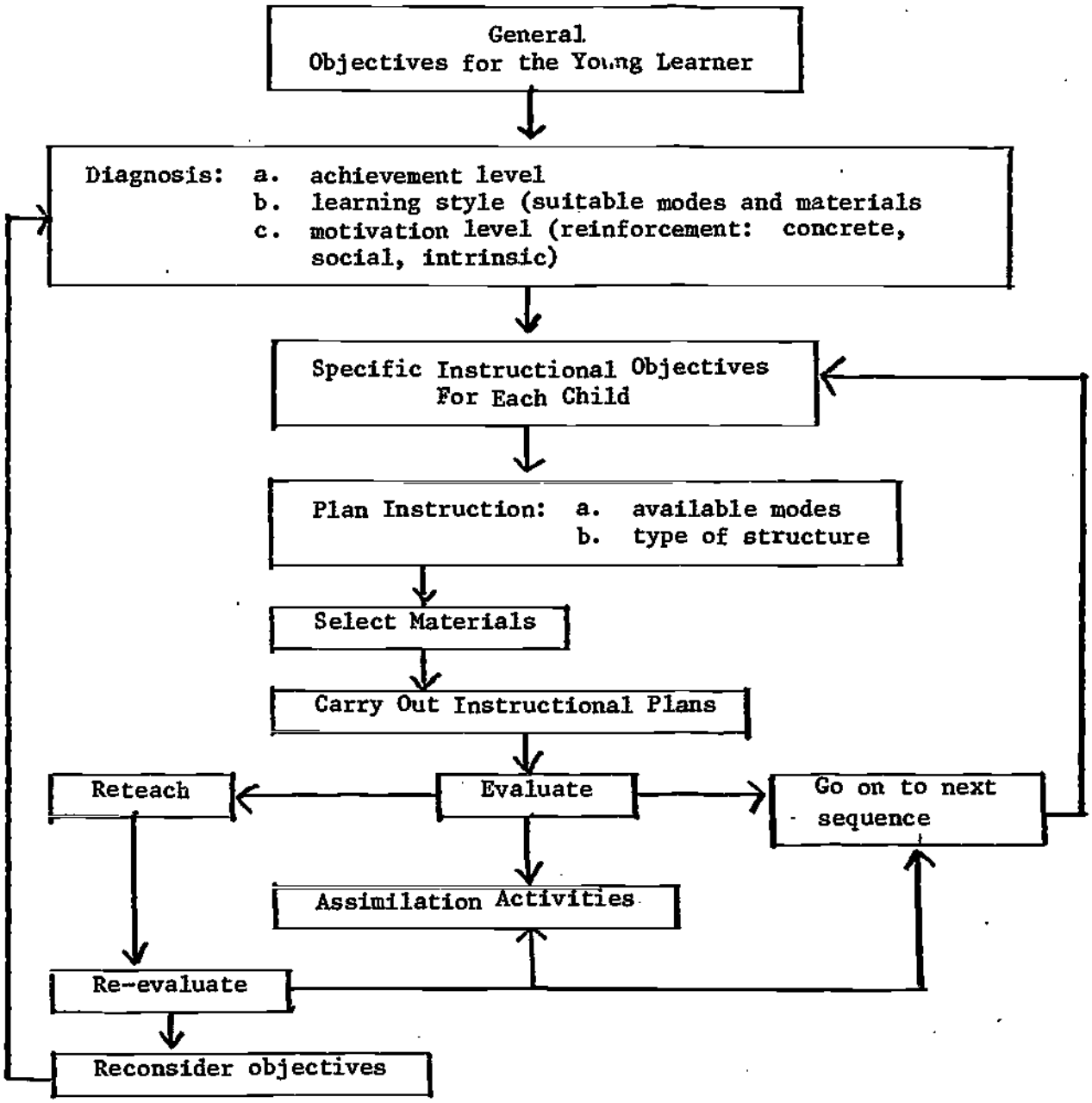

Figure 1

A Systematic-Diagnostic Sequence of Teaching Activities

OBJECTIVE	PERFORMANCE TERM	CONTEXT	ACCEPTED STANDARD
When asked by the teacher he can construct a base for a house using 4 blocks.	construct	when asked by the teacher	using four blocks
From an assortment of 12 picture cards he can turn over all that represent an animal.	turn over	from an assortment	recognizing all that represent animals
Without hesitation he can count out 10 chips from a handful held by teacher.	count	from a handful held by teacher	10 chips

Figure 2

Sample Behavioral Objectives
(Hess and Croft, 1972, p. 318)

Concepts	Relational	Position	Over, under Beside In front of Behind Between	List specific activities to help the child learn these concepts.
		Size	Longer-shorter Longest-shortest Larger-smaller Largest-smallest	
		Numbers	One-to-one	
			Counting	

Figure 3

Chart of Objectives
(Nimnicht, 1970, p. 13)