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ABSTRACT

A new model for in-service and preservice teacher training programs has been developed. The Skill Development in Teaching (SKIT) was suggested by recent research combining two teacher training techniques developed in the past decade, Interaction Analysis and Microteaching. Some educators who have worked with both Interaction Analysis and Microteaching have felt that they are compatible and even complementary. The proposed SKIT model is an attempt at combining significant aspects of the two techniques in a model for maximally effective skill training programs. Skill sessions, which emphasize various teaching behaviors to be practiced, are an integral part of the SKIT program: Orientation Practice helps teachers learn how to prepare their students for subsequent activity; acceptance of student feeling as well as student ideas is another skill that is taught; also, through skill sessions, teachers are taught question skills which involve answering cognitive, convergent, divergent, and evaluative questions. (Author/JB)

INTERACTION ANALYSIS AND MICROTEACHING IN AN URBAN TEACHER EDUCATION PROGRAM  
 A MODEL FOR SKILL DEVELOPMENT IN TEACHING

by

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A new model for in-service and pre-service teacher training programs has been developed at Temple University. The Skill Development in Teaching (SKIT) model was suggested by recent research combining two teacher-training techniques developed in the past decade, Interaction Analysis and Microteaching. Some educators who have worked with both Interaction Analysis and Microteaching have felt that they are compatible, and even complementary. The proposed Skill Development model is an attempt at combining significant aspects of the two techniques in a model for maximally effective skill training programs.

As early as 1960 (Flanders, 1963), Interaction Analysis was used as a device for giving in-service teachers feedback on the patterns of student-teacher interaction typical to their classes. In Interaction Analysis, a trained observer collects data on student-teacher interaction sequences and records these data in tabular form. A summary matrix may then be compiled from the data for use by the teachers in analysis of their own classroom behavior. Since 1961, a number of projects have successfully utilized

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Interaction Analysis as a method of sensitizing pre-service teachers to their own teaching styles (Amidon and others, 1967).

More recently, the technique of Microteaching has been employed in pre-service teacher education as a method for developing specific classroom teaching skills. In Microteaching, the complexity of the teaching task and the size and duration of the class are drastically limited to facilitate focusing on the accomplishment of the stated objective of the microlesson, and a variety of feedback devices are employed in its evaluation.

One of the first attempts to use Interaction Analysis and Microteaching combined was in 1961 in a Laboratory on Teacher Role Behavior at Temple University. The purpose of this Laboratory was to train teachers in the use of Interaction Analysis as an observational tool for use in obtaining feedback on their own classroom interaction patterns and to encourage the teachers to use Interaction Analysis in developing and practicing desired teaching behaviors. The procedure for each microlesson included (1) the development of an ideal "teaching style plan." In other respects analogous to a typical lesson plan, the teaching style plan was for a smaller lesson, and it included a statement of the interaction analysis categories the teacher would primarily use for the particular lesson. (2) The teacher taught a five- to ten-minute lesson, using a small group of her peers as a class. (3) The trained Interaction Analysis observer recorded the student-teacher interaction patterns in the lesson. (4) At the end of the lesson, the teacher was given the data collected by the observer as well as comments from the teachers who had acted as her class. In these early attempts there was no effort made to have the teacher repeat the same teaching pattern until she was successful. The aim was rather a demonstration of how teachers

might practice producing a particular teaching style or a desired set of teaching behaviors.

The project on student teaching (Amidon and others, 1967) also made use of the exercise just described for all the student teachers involved in an experimental group. In this exercise, student teachers were asked to teach five-minute lessons utilizing teaching behaviors that are thought to be effective but are rarely found in typical classroom situations. Specifically, they were asked to practice (1) asking broad or divergent questions, (2) making extended praise statements which included public criteria for the praise, and (3) making extended statements accepting student ideas.

Perhaps the most recent and sophisticated efforts in combining Interaction Analysis and Microteaching have been (1) the Intern Teaching Program at Temple University using the approach developed by Rosenshine and Furst and (2) the In-Service Program which has been used by Minnis at the University of California at Davis. Rosenshine and Furst developed what might be described as a complete meshing of the two techniques of Microteaching and Interaction Analysis. Working with teaching interns at Temple University, their program included the following procedural elements:

- (1) A specific statement of teaching skills defined in terms of Interaction Analysis categories which the teacher would try to produce in a microlesson.
- (2) A scaled-down classroom situation with very restricted teaching objectives for a lesson approximately five minutes in length.
- (3) A small class of approximately six to ten students.
- (4) Immediate feedback to the teacher via videotape playback.
- (5) Feedback of Interaction Analysis data indicating the extent to which the teacher was able to produce the desired behavioral categories.
- (6) Feedback from students in the class about their perceptions of the teacher.
- (7) Repetition of the whole process

until the teacher had accomplished the desired specific teaching objective and produced the behaviors he was attempting to produce.

#### Background Research

Before attempting to describe the proposed skill training model in detail, it seems appropriate to review briefly some of the research which has been done in Microteaching and in skill training using Interaction Analysis. That research might be divided into three types: prediction studies, training studies, and experimental studies.

Prediction Studies. Prediction studies attempt to determine whether the ratings or behaviors observed in a microteaching situation correlate with the ratings or behaviors observed when the teacher is in the classroom.

For a number of years, pre-service intern teachers in the Stanford Summer Micro-Teaching Clinic were ranked according to the ratings which pupils gave the teachers' lessons. During the regular teaching year, the interns also received ratings on their teaching from their supervisors. Dwight Allen (personal communication) reports that those teachers whose Microteaching was ranked lowest received lower reports on their regular teaching than teachers who received the highest ratings in Microteaching.

Similarly, pre-instructional Microteaching ratings were used to rank teachers who were considered for employment at a suburban school district near Stanford. Teachers taught a Microteaching lesson, but their ratings on these lessons were not reported to the board making the choice of teachers. At the end of the year, the rankings were studied and compared to the board's hiring decisions. All teachers but one who were rated low in Microteaching were also not hired by the board. The one low-rated teacher who was hired proved to be a problem teacher during the year. (Sobol, informal communication.)

Morsh (1975) asked instructor candidates in the Air Force to give verbal presentations to boards consisting of six supervisors and instructors and found that the ratings given in these presentations had correlations which were neither high nor significant with student ratings of the instructors.

Ober (1977) studied the relationship between the teaching behavior of student teachers in a microteaching situation before they began student teaching, and their teaching behavior while student teaching. Two groups were considered separately: 30 student teachers who received training in Interaction Analysis and 30 student teachers who received other types of training. The microteaching lesson lasted for 30 minutes, and other student teachers role-played students. Two prediction measures were developed from the microteaching performance: an I/D ratio (roughly similar to the Flanders I/D ratio) and a S/T ratio (ratio of all student talk to all teacher talk). Each of these measures was correlated with 42 variables developed from interaction analysis matrices and the behavior of the trainees during student teaching. The I/D ratio had a significant correlation with five of the 42 measures for those receiving Interaction Analysis training, and no correlation with any of the predicted measures for those not receiving Interaction Analysis training. The S/T ratio taken in the microteaching situation had a significant correlation with nine of the 42 dependent measures for those receiving Interaction Analysis training and with nine of the 42 measures for those not receiving Interaction Analysis training. It is interesting to note that for neither group did the Interaction Analysis measure taken in microteaching correlate with the Interaction Analysis measure taken during actual training; and neither did the S/T ratio taken in microteaching correlate significantly with the S/T ratio

which was taken during training.

There were more significant correlations when four prediction variables were used in a multiple correlation equation. The four prediction variables were: score on the Dogmatism Scale developed by Rokeach, score on the Teaching Situation Reaction Test developed by Hough, the I/D measure taken from the simulated teaching situation, and the S/T measure taken from the simulated teaching situation.

Amidon (1977) conducted an experiment and two replications in order to test the relationships between the training of cooperating teachers (school supervisors), certain course content, and the behavior and attitudes of student teachers. One finding, consistent across the three experiments, was that student teachers taught Interaction Analysis used significantly more behaviors labeled "indirect" when they were in the classroom than student teachers not so taught. As part of their university instruction, the student teachers who received training in Interaction Analysis spent two hours a week in laboratory sessions in which they listened to and coded audiotapes and practiced the relevant behaviors in a role-playing situation.

Training Studies. During each summer of the Stanford Micro-Teaching Clinic (since 1950) data has been collected on changes measured during training. In these studies, the significance of gains from week to week were tested. The dependent variables were student ratings. Studies in this area (Allen and Fortune, 1956; Fortune, 1958; Cooper, 1958; Aubertine, 1977) have consistently shown that students receive increased student ratings during training.

Experimental Studies. The experimental studies in Microteaching, conducted primarily at Stanford, have had two objectives. The first is the development of specific teaching skills which can be measured in terms

of frequency of a behavior. The second objective has been to conduct basic and applied research into the effectiveness of various training procedures. This research has not yet been brought together, so that only a few of the studies are mentioned here.

The validity of Microteaching training as compared to no training is fairly well established. In the initial study by Aubertine (1964), one group of pre-service intern teachers received Microteaching training during their first summer, while a second group served as teacher aids and observers in regular summer-school classrooms. The teaching behaviors of the two groups in a Microteaching situation at the end of the summer, and in their regular classrooms at the start of the year, were rated and compared. In both situations, the group receiving Microteaching training had significantly higher ratings.

Another series of experiments has been conducted at Stanford University on training variables in Microteaching. Five of these have been reported at previous AERA meetings.

McDonald, Allen, and Orme (1966) studied the effect of different training procedures upon the reinforcing behavior of teachers in classroom discussion. Although this experiment has most of the elements of Microteaching--short period of time (20 minutes), specific skill, videotape feedback--the research did not take place in a Microteaching situation. Instead, videotape recordings of the teacher's classroom instruction were studied. The most effective training procedure was one in which the supervisor provided the teacher with reinforcement for desired behaviors and also provided the teacher with discrimination training which consisted of pointing clues in the videotape to which the desired teacher behavior should be attached. The next most effective procedure was one in

which the supervisor only reinforced the teacher when he emitted the criterion response. The least effective experimental treatment (aside from the control) was one in which the interns rated their own responses to student talk without receiving supervision.

Allen, McDonald, and Orme (1965) used time between training sessions as the dependent variable. In this experiment videotape recordings of classroom teaching were used. Although all treatment groups improved in their use of the criterion behavior, none of the time periods between videotape sessions appeared to be more effective than another.

A third experiment (Orme, McDonald, and Allen, 1966) compared two types of presentational variables: symbolic modeling, in which the desired behaviors are transmitted to the learner by means of written or verbal instructions, and perceptual modeling, in which they are transmitted by means of a filmed model who portrays the desired behaviors. The most effective training procedure was one in which the subjects viewed a videotape playback of their own performance, plus a videotape of an experienced teacher who modeled the criterion behavior. During both viewings, a supervisor verbally reinforced the desired response and suggested variations which the intern might attempt in his teaching. The second most effective treatment was one in which the intern viewed a videotape of his own performance alone, and viewed the model videotape with the experimenter. The least effective treatments were those in which the interns did not see the model tape but viewed the tape of their own performance either alone or with a supervisor.

A fourth experiment (Allen, Berliner, McDonald, and Sojol, 1967) investigated the effects of variations on three types of training variables: (a) viewing a videotape made by an experienced teacher which models the

desired behavior as compared with reading a transcript of the videotape, (b) studying model videotapes or transcripts which contained only positive instances of the behavior as against one which contains both positive and negative instances, and (c) imitating the model lesson in the training session as against developing any lesson for the training session. When the performance of interns in the various training groups was compared on a transfer task in which all developed their own lessons, the groups highest on the criterion task were those who studied lessons which contained only positive instances of the desired behavior. The other variables did not appear to differ in effectiveness.

#### Skill Development in Teaching (SKIT) Model

The proposed SKIT model for teacher training consists of the following five elements derived from research and development in Interaction Analysis and Microteaching.

1. Statement of Objectives. Elements of desired teaching style are stated in terms of precise behavioral objectives which correspond to categories of the Interaction Analysis (or alternative) system.

2. Skill Session. A microlesson, characterized as having limited learning objectives, to be taught to a small group in a short period of time is the vehicle for practice of a restricted pattern of teaching behaviors.

3. Data Collection. Four types of data are collected during the skill session: (a) an observer trained in Interaction Analysis records the teacher and pupil behaviors in sequence; (b) a video or an audio tape recording is made of the session; (c) students record their perceptions of teaching behaviors relevant to the stated objectives; and (d) the consultant or supervisor records information which will help him focus the feedback session.

1. Practice. Steps 2, 3, and 4 are repeated until the objectives stated in Step 1 are satisfactorily accomplished.

Stating Objectives. Many psychologists interested in Programmed Instruction have been trying to impress upon educators the importance of stating objectives in behavioral terms. The argument is that if the objective is stated in such a way that behavior indicative of the objective can be observed directly, then it is possible to determine precisely when the objective has been accomplished and when it has not. Objectives may be expressed in terms of student behavior or in terms of teacher behavior. In the proposed SKIZ model, the first step in developing teaching skills is to state, in very specific terms, the teaching behaviors that the teacher is attempting to develop. The method employed for achieving this specificity is to express the skills in terms of Interaction Analysis categories of teacher behavior, categories of other observational systems currently available, or new categories which are developed in work with the trainee. Teachers are trained in the use of Interaction Analysis or another system of behavioral categories for evaluation of attempts at producing specific desired behavioral patterns.

Skill Sessions. Teaching skill sessions are sessions in which the participant playing the role of teacher practices specific classroom behaviors in a Microteaching context. Members of the class are role-played by others participating in the training program. The class size is limited to between five and ten students, and the duration of the lesson is restricted to five or ten minutes. The skills to be practiced are prescribed by the consultant, and are defined in terms of frequency and duration of specific Interaction Analysis categories or category sequences.

Data Collection and Feedback. In effect, the nature of the feedback and the way in which it is given is the most significant feature of the model. Four types of feedback are available to the supervisor: data expressed in a category system, videotape or audiotape recording, perceptions of the students, and perceptions of the supervisor. The effectiveness of the session in which the four types of feedback are presented to the teacher is dependent upon the skill of the supervisor.

The use of a category system such as Interaction Analysis is particularly appropriate for purposes of gathering precise and relatively objective data for use as immediate, quantitative feedback to the person attempting to achieve or improve a particular teaching skill. With Interaction Analysis or a similar category system, the teacher can obtain immediate feedback of the amount and kind of category used, and can tell whether or not he was successful in any skill session which may be analyzed within the framework of the particular category system. The primary advantage of this particular approach is its potential for precision and objectivity. Even when viewing a videotape record of a lesson, it is possible for a teacher to avoid focusing on the precise behavior desired in a skill session. (For example, people are often distracted or biased by mannerisms or physical characteristics.) However, with a summary of specific data the teacher is able to evaluate his achievement of the specific objectives of the skill session in terms of the number and duration of instances of desired behaviors. An expanded Interaction Analysis system is summarized in Table I (Amidon, 1955).

At the end of a skill session, those members who have been playing the parts of students may be given small sheets of paper on which they can record their reactions to the teacher's behavior. In each case, their reactions should be relevant to the objectives of the skill session. In

TABLE I

MODIFIED INTERACTION ANALYSIS CATEGORY SYSTEM

TEACHER TALK	<ul style="list-style-type: none"> <li>1. Accepts Feeling</li> <li>2a. Praises</li> <li>2b. Praises Using Public Criteria</li> <li>2c. Praises Using Private Criteria</li> <li>3. Accepts Idea Through:               <ul style="list-style-type: none"> <li>a. Description</li> <li>b. Inference</li> <li>c. Generalization</li> </ul> </li> <li>4. Asks:               <ul style="list-style-type: none"> <li>a. Cognitive Memory Question</li> <li>b. Convergent Question</li> <li>c. Divergent Question</li> <li>d. Evaluative Question</li> </ul> </li> <li>5. Lectures</li> <li>6. Gives Direction</li> <li>7a. Criticizes</li> <li>7b. Criticizes Using Public Criteria</li> <li>7c. Criticizes Using Private Criteria</li> </ul>
STUDENT TALK	<ul style="list-style-type: none"> <li>8. Pupil Response:               <ul style="list-style-type: none"> <li>a. Description</li> <li>b. Inference</li> <li>c. Generalization</li> </ul> </li> <li>9. Pupil Initiation:               <ul style="list-style-type: none"> <li>a. Description</li> <li>b. Inference</li> <li>c. Generalization</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>10. Silence</li> <li>11. Confusion</li> </ul>

addition, they can write comments on their general feelings about the particular lesson. This provides the teacher with additional information about the effect of his behavior on the class.

The third feedback device, the audiotape or videotape record, is particularly useful because it presents the teacher with a complete and objective, although undifferentiated, record of his behavior. The supervisor can focus attention on specific instances of desired or undesired behavior, however, by stopping the tape at appropriate points to discuss the relevant behaviors with the teacher.

It is recommended that the supervisor be as descriptive as possible, refraining from comments such as "We didn't do very well there." The effect of negative evaluation may not be desirable, and in any event since objective data is available, it seems unnecessary to provide criticism and negative comment.

The data collected by Interaction Analysis, in particular, can simply be presented to the teacher in either summary matrix or basic data form with the key tallies pinpointed. The consultant may point out on the data sheet in what ways the teacher's behavior either coincides or fails to coincide with the objective of the skill session. Again, it is one of the strengths of the proposed model that it is unnecessary for the consultant acting as supervisor to make any value judgments of his own. Interaction Analysis may be used to provide data on the basis of which the teacher can evaluate his own teaching performance.

Practice. Practice is one of the essential elements in any skill development program. In any textbook on applications of learning theory to teaching, it is noted that students have to have adequate time to practice. The microlesson itself provides a controlled setting in which specific.

skills or teaching behaviors can be practiced. However, practice in a microlesson is not the same as practice in the actual classroom situation. Most people would agree that there are many conditions present in the so-called real classroom which do not exist in the microclassroom or in the student teaching class; so that while the skill development program which has been outlined here is designed to develop an increase in the range as well as the depth of the teaching repertoire, it does not guarantee the eventual transfer into the real classroom situation. One solution which the model described here suggests is the possibility of expanding the total model and adapting it to use by the teacher in his own real classroom as a follow-up to successful completion of skill sessions. Objectives can be stated as a particular teaching style suited to a specific curriculum. Thus, the teacher could consider developing a rather complex set of objectives for a science discovery lesson, a new mathematics lesson, or a social studies inquiry lesson. Data collection can be accomplished in a way similar to that described here, that is, the teacher can make the arrangements to have his lesson put on tape, and this tape can be coded in Interaction Analysis categories by another classroom observer or by the teacher himself. The coded data can then be analyzed in terms of the objectives which the teacher has established. Thus, the teacher gives himself feedback about the extent to which he has accomplished the objectives for each recorded lesson. After he has analyzed his lesson, he should identify the discrepancies which exist between the objectives he has proposed and the actual behavior which he has produced in the classroom. When discrepancies are isolated, he will want to practice the specific teaching skills in question. Thus the evaluation of "teaching effectiveness" can be continued by the individual teacher, with the teacher himself

setting his own goals and constantly re-evaluating the extent to which he is achieving his goals in the classroom.

#### Suggested Skill Sessions

Obviously, there are a large number of specific teaching behaviors that could be practiced. For practical purposes, we have included only a few as examples of patterns that seem to represent some of the more important teaching behaviors but which rarely occur in typical classrooms. Included in each suggested skill session are the Interaction Analysis or modified Interaction Analysis system category numbers which can be used to identify instances of the desired behavior. Instances of other behaviors are coded according to the basic Interaction Analysis system categories. A skill session should be practiced by the person playing the role of teacher until the relevant skill has been perfected, and then the person can move on to a new skill.

1. Orientation Practice. The purpose of this lesson is to help teachers learn how to prepare their students for a subsequent activity. Three types of orienting statements are suggested, and they are all coded within Category 5 of the Interaction Analysis system. Category 5a designates orienting statements which provide cognitive structure for the task by giving the students an overview of the assignment; 5b is used for statements which focus the students by specifying what performance will be required of them; and 5c refers to statements such as analogies or other models which are designed to aid the student in his performance of the task. Following the initial orientation, the teacher asks a question such as, "Are there any questions?" Then there may be a period of student questions followed by teacher acceptance of the question and then further elaboration and orientation. The skill practice session ends with the

teacher's specific directions about what the children are to do. In this session, it is important for the student playing the role of teacher to try to make his orientation as clear as possible and free of any repetition not specifically designed to make the point clear.

2. Acceptance of Student Feeling. Skill in accepting student feeling is evidenced by two or more Category 1's recorded in sequence. In this particular skill situation, it is necessary to have student expression of feeling in order that the teacher may practice accepting the feeling. Therefore, it is necessary to provide roles for the students which allow for some expression of feeling. Acceptance of student feeling by the teacher may be of several different kinds.

a. The teacher can simply say, "I understand how you feel," or the like.

b. The teacher can reflect, summarize, or paraphrase the student's expression of feeling, in statements such as "... so the problem is too hard for you, Johnny, and it's making you very frustrated."

c. The teacher may use a word which defines the student's feeling, as in the following examples: "You seem pretty excited." "I see we're excited today." "I see we're very depressed." "Everybody appears rather annoyed with that suggestion. I guess you're angry."

d. The teacher may attempt to relate the student's feeling to a general feeling that people have, or perhaps to the teacher's own feeling. Samples of this type of statement are: "Generally, people do tend to get upset when they try and try to do something and are continually blocked in their accomplishment," or, "Sometimes I get rather upset myself when I'm frustrated in this way."

Acceptance of student feeling is a skill that's apparently difficult

for teachers to develop, since in normal classroom interaction very few instances of this behavior are observed.

3. Providing the Criteria for Evaluating the Students' Statements as Appropriate or Good. This skill session is designed to give teachers an opportunity to practice praising student contribution only when they can provide criteria for evaluating the contribution along with the praise itself. Marie Hughes has discussed advantages of presenting public criteria for students as against other kinds of criteria that a teacher might use. We can define public criteria as reasons which the student can understand for why his thinking or his answer was good. Such statements as: "The answer is correct because you remembered to invert the divisor," and "The organization you used in your group, Johnny, was good because you gave everybody an opportunity to present his report," are examples of praise with public criterion. They can be contrasted with a statement such as "I like your group's organization, Johnny." Given this type of praise, the student may or may not know why the teacher likes what he has done. There is some support for the notion that by providing children with these types of criteria for praise statements children are made more independent of the teacher and may be better able to work effectively on the learning task without constant reinforcement from the teacher or other authority figure. In this skill session, the person role-playing the teacher is asked to produce praise statements following student answers which include a minimum of two Category 2's in sequence. The assumption here is that a minimum of five or six seconds are required for giving both praise and criteria for it. The role player therefore practices giving only praise statements which are of this length and which include the public criteria.

When the classroom interaction is coded, separate subdivisions of

Category 2 of the basic Interaction Analysis system are used for repetitive praise (2a), praise which utilized public criteria (2b), and praise which utilized private criteria (2c); see Table I. Further elaboration of these categories is contained in Amidon, 1965. This skill session is another particularly appropriate one to concentrate on, since observations of typical classrooms indicate that extended praise statements giving public criteria for evaluating the student contribution occur relatively infrequently in normal classroom interaction.

4. Acceptance of Student Ideas. This skill session is similar to Number 2, but it is designed to provide practice in rephrasing, summarizing or reflecting an idea or an opinion which has been expressed by a student. Included in this skill session may also be practice of making summary statements of ideas expressed by several students. The criterion is (as in the second skill session) duration of the behavior, evidenced by two or more Category 3's recorded in sequence. In this particular skill session, it may be appropriate for the teacher to begin by summarizing as accurately as possible what individual students, or groups of students, have said. One of the important functions of learning this particular skill is that it helps the teacher to focus on what the student is saying and therefore should improve communication between the students and the teacher. After the initial skill of simply reflecting what the students have said is mastered, skill sessions may go beyond simple restatement of what a student has said and emphasize actually using the student's idea. An example of this might be a statement such as, "Well, Johnny, you suggested that we should withdraw from Vietnam. Apparently you feel that the war in Vietnam is a threat to world peace." In this statement, the teacher has gone beyond simple restatement of what the child has said to making an

inference from what the child has stated.

5. Asking Questions. The categories used here can be modified, depending upon the situation or the needs of the particular training program. However, the basic model we are using for this skill session is one developed by Aschner and Gallagher. This skill session is divided into four parts which are then combined into a fifth session.

a. Cognitive Memory Questions. The cognitive memory question is one which requires the student to recall a particular fact or bit of information which he has learned and has stored in his memory. The objective is simply to ask only cognitive memory questions. Generally speaking, this is not difficult, and the person who is playing the role of teacher in this skill session will not find it difficult to produce this type of question. It is interesting to notice, however, the types of student response following cognitive memory questions; that is, it is interesting to note both the type of thinking involved in the response and the length of the response.

b. Convergent Questions. The convergent question is one which requires the student to use some information in a particular process and come out with an answer. In a convergent question, there are right answers. For a first-grade child, for example, a question like, "If you take five blocks out of your pile of 15 blocks, how many blocks will you have left in the pile?" would be a convergent question. For a college student, a question such as "Compare the question categories developed by Aschner and Gallagher with the categories for questions developed by Hilda Tauba" would be suitable. This would also be a convergent question, although it is slightly different from the first in that the student is required to make a comparison between two systems that he is familiar with. Of course, again, in this skill session the student is to ask only convergent questions

in his lesson. It is interesting also to notice the type and length of response which follows convergent questions.

c. Divergent Questions. Divergent questions are those to which there is no right answer. They may require judgments about what a situation might have been like or will be like, or about what conditions would prevail under certain other conditions, and so on. This type of question often asks a student to speculate or make predictions. They typically require the student to make judgments, but not value judgments. An example of a divergent question might be, "What do you think the cities of the next century will be like?" "What kind of interpersonal relations do you think Columbus maintained with his crew?" or "What kinds of relationships do you think Columbus might have developed with the Indians if he had landed in India instead of the Western hemisphere?" or "What do you think the development of the cities in the United States would have been like if colonization had taken place from West to East, rather than from East to West?" These questions require prediction, judgment, speculation; in some cases the answers are certainly based upon factual information, but a divergent question, in contrast to a convergent question, has no right or wrong answer.

d. Evaluative Questions. Evaluative questions are questions in which the student is being asked to determine the appropriateness or the adequacy of an idea or opinion; that is, the student is actually being asked to give his opinion. "Do you think it was a wise move to increase the sales tax in the state of Pennsylvania?" "Do you feel that we should get out of Vietnam?" Questions such as these ask the student to determine whether an idea is good or bad, appropriate or inappropriate. In this skill session, the student playing the role of teacher is expected to

ask only questions categorized as evaluative.

e. Combination Question-Asking Practice. This is a combination of the four previous sessions. The person playing the role of the teacher may be asked, for example, to ask a cognitive memory question, then a convergent question, followed by a divergent question, followed by an evaluative question. This is the most difficult of the four sessions, and therefore satisfactory completion of the previous four should be considered prerequisite to using this particular skill session.

When this skill is being practiced, each type of question is recorded as a subdivision of Category 4 in the Interaction Analysis system. Thus, cognitive memory questions are coded as 4a, convergent questions as 4b, divergent questions as 4c, and evaluative questions as 4d.

6. Giving Criticism with Public Criteria. This session is similar to the one designed for practice in giving positive evaluation with public criteria, except that in this session the person playing the role of the teacher is asked to include a public criterion when he tells a student that his behavior is inappropriate or that his answer is wrong. When this skill is being practiced, Category 7 is modified so that the use of criticism with public criteria is labeled 7b, and the use of criticism with private criteria is labeled 7c.

#### General Considerations in Using the Model

In using the proposed model, we have found that there are a number of considerations relevant to its effectiveness. The following seem particularly noteworthy.

1. This model cannot be used unless teachers are first trained in Interaction Analysis, so that they are able to understand and interpret

data representing teaching patterns they are attempting to develop. While Interaction Analysis is relatively simple to learn, other systems, though more complex, are also useful within this model, as are modifications of the basic Interaction Analysis category system. For example, categories such as divergent and convergent questions, public and private criteria for evaluating student behaviors, and levels of student thinking could be included in the basic Interaction Analysis system (Amidon, 1965). Table I suggests one modification that seems to be particularly appropriate. The time involved in training teachers according to the SKIT model is likely to be greater, then, than was required for earlier programs in basic Interaction Analysis or in Microteaching.

2. A second problem is the motivation of the teacher attempting to improve his teaching skill. To analyze his own teaching and work intensively on specific teaching behaviors requires a good deal of commitment on the part of the teacher. When a teacher, student teacher, or teaching intern is involved in a program in which his participation in the skill development sessions we have described is required by a school district or by a teacher training institution, motivation is to some extent built into the structure of the program. A teacher may participate because he wants a particular grade in the course, or because he is being paid by his school district to improve; or he may be working in a program with other teachers on a strictly voluntary basis. In any event, he may have support from other teachers and administrators under these circumstances. Moreover, the difficulties encountered in trying out a given skill may not be unique individual problems; they may be shared with others and discussed so that the teachers receive reinforcement and support where needed. On the other hand, when a teacher is working by himself in attempting to

develop and refine teaching skills in the day-to-day classroom situation, discouragement and low morale may develop.

3. Skill training in this type of modular program may be thought of as artificial. A number of people have suggested that any kind of skill development program which attempts to ignore conditions present in the real classroom situation has a kind of unreality about it. This may in fact be the price that one has to pay when he participates in a program which attempts to isolate teaching skills as specific behaviors that can be practiced and integrated into a total teaching style.

4. The model described here is often alleged to inhibit creativity or free expression in teaching behavior. To some extent this is regarded by many as a real danger. For example, in developing the use of appropriate listening behavior through reflection or summary of what the other person has said, does one totally extinguish from his repertoire other desirable behaviors, such as spontaneous insight, excitement, or enthusiasm? This is a question often raised, and a danger that should certainly be clarified for those who attempt to use the model suggested here. In effect, the training indicated by such a model has as an objective the freeing of participants from stereotypic reactions to the classroom interaction. If a person going through such training finds himself stuck in the rut of repeating such phrases as, "I guess you're saying . . ." "I understand how you feel . . ." "You may be suggesting, then, . . ." or "That's very interesting . . ." then the goals of the training have certainly not been achieved. Training under the proposed model should produce behaviors that are the antithesis of those just described.

5. In the actual use of this procedure, the various steps are not always as clear-cut as they might appear to be on paper. In the training

which must precede the formal use of the skill training model, elements of the model may be utilized in a less systematic manner. For example, teachers may role-play certain Interaction Analysis categories as an aid to learning the categories. They will receive feedback about how effectively they have used the behavior corresponding to the category number. They will also receive practice in collecting data with the Interaction Analysis system. Since Interaction Analysis forms a basis both for the skill training and the feedback, effective application of the model depends upon this initial training program. In all areas of applied social science, models that seem to be useful on paper fail in practice. An essential ingredient in the development of training programs based upon the proposed model which cannot be included in the model as outlined here is the skill of the consultant who acts as supervisor to the program.

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