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ABSTRACT

A study examined the comparative effects on microteaching performance of (1) eight different methods of teacher training and (2) the interaction of method with student characteristics. Subjects, 71 enrollees in an educational psychology course, were randomly assigned to eight treatment groups (including one control group). Treatments consisted of various combinations of three basic training conditions: microteaching, lectures on teaching skills, and sensitivity lectures. Each student's posttest microteaching presentation was taped, and his criterion score was obtained by averaging two independent ratings of the tapes. Six different instruments were administered to collect data on student characteristics: attitude, anxiety, divergent thinking, interest, personality, and values. Data was analyzed with a 2 x 8 analysis of variance design. Results revealed significant differences among several methods. In general, students with microteaching training performed better on terminal tests. Students high on flexibility performed better across treatments than others. Two significant interactions of method and characteristics were found: (1) students low in objectivity did better in the treatment involving all three conditions than those high in objectivity, and (2) students low in social values did better in the teaching-skill lectures treatment than those high in social values. (JS)

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ANALYSIS OF THE INTERACTION OF STUDENT CHARACTERISTICS WITH METHOD IN MICRO-TEACHING[1]

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This investigation was designed first to determine whether learner characteristics interact with several methods of teacher training to produce differential levels of micro-teaching performance. The term micro-teaching is used to indicate the procedure in which a student presented a brief lesson to a small group of peers. Secondly, the investigation was designed to determine whether there were differences among the teacher training methods which resulted in different levels of micro-teaching performance. Thirdly, the investigation was designed to determine whether there were differences between high and low students on each learner characteristic in their performance in micro-teaching.

In his presidential address to the sixty-fifth convention of the American Psychological Association Cronbach (1957) spoke of the two streams of psychology: experimental and correlational. He indicated that the eventual union of these two areas would result in great gains for educational psychology. Cronbach made several references to the importance of studying the interaction of individual differences with treatment effects. One of his statements particularly illustrates this view:

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> Ultimately we should design treatments, not to fit the average person, but to fit groups of students with particular aptitude patterns. Conversely we should seek out the aptitudes which correspond to modifiable aspects of the treatment. (p. 681)

Numerous studies have investigated the relationship of various student characteristics with academic achievement. For example, Lavin (1965), in his review of research on prediction of academic performance, concluded that there was a well established relationship between anxiety and academic achievement. McKeachie (1963) reviewed the relationship between attitudes and learning; he concluded that although the relationships are often low, it still seems preferable to have students in classes where they have positive attitudes toward the situation. Several authors such as Darley and Hagenah (1955) and Strong (1943) have reviewed the research on the relationship of interest and academic performance. These reviews indicated that the relationship was rather low; however, Cronbach (1949) suggested that such measures, used in conjunction with others, have a greater predictive value than when used alone.

Research on the use of divergent thinking tests to predict academic achievement has brought positive results in a number of studies such as those by Torrance (1963) and Feldhusen, Denny, and Condon (1965). Cortis (1968), using three divergent thinking tests with college students, reported that verbal fluency was related to classroom success of student teachers. Getzels and Jackson (1962) reported that divergent thinking abilities accounted for a significant portion of the variance in school achievement. The use of personality measures to predict achievement has

been reported in several studies. For example, Warburton, Butcher, and Forrest (1963) reported that personality factors provided the best prediction of the grade in student teaching.

In addition to research on the relationship of various student characteristics to achievement, some research has been reported on the interaction of such characteristics with varying methods of instruction. For example, King (1968) summarized several studies which attempted to determine whether instructional treatments in mathematics interact with student abilities to affect achievement. One such study was done by Kropp, Nelson, and King (1967) who used four sets of instructional materials on elementary set concepts: verbal-deductive, verbal-inductive, figural-deductive, and figural-inductive. They reported that the treatments were equally effective for heterogeneous groups. However, they did find that tests of deductive ability were better predictors of performance in deductive materials while test of inductive ability were better predictors for performance in inductive materials. In another study in mathematics, Davis (1967) constructed materials that were different in sematic and symbolic content. He reported that treatments were equally effective for homogeneous groups, but that the groups with high symbolic ability performed better with the symbolically constructed materials.

There are numerous other studies relating to the interaction of treatments with individual differences; however, experiments dealing with the variables treated in this study are of particular interst. Campeau (1965) reported that in a program on the earth-sun relationships, fifth-grade girls who scored high on test anxiety did best with a program which provided feedback while those girls who scored low in test anxiety did best

with a program without feedback. Lublin (1965) reported that college students in an introductory psychology course who scored high on autonomy need did better under programmed instruction than did those students who scored low on the same need.

Feldman (1965) found an interaction of verbal ability with type of material. He reported that subjects with low verbal ability achieved better when they studied from a printed text rather than from program frames. Denny, Paterson, and Feldhusen (1964), in their study of students enrolled in an undergraduate educational psychology course, found that method interacted with IQ. In this study three instructional treatments, daily tests, reviews, or self-study were used with the subjects. The review method interacted with IQ level to produce greater achievement for average and high IQ subjects than for low IQ subjects.

These reviews and studies indicate that some interactions between individual characteristics and method of instruction have been found which result in differential performance. While it seems likely that many instructional techniques will probably work well with children who have widely varying personal characteristics, it also seems likely that there will be many other treatments which, by their nature, with interact with characteristics, to cause differential levels of performance. The characteristics which were reviewed were selected for use in the present study because of their potential relevance ot the methods of training used.

PROCEDURE

Subjects

The subjects were 71 sophomore, junior and senior level students enrolled in one large division of an educational psychology course. The subjects were assigned at random to eight treatment groups.

Treatments

The treatments were eight different methods of teacher training. The treatments consisted of various combinations of three basic conditions. The first condition, micro-teaching, consisted of the students' presenting five sets of short (5 - 8 minutes) lessons involving a teach and reteach session. The students were allowed to teach any subjects of their choice. A videotape was made of each teaching session; after each session the students reviewed the tape. Each lesson was retaught once, but the students were not required to view the reteach tape. The second condition, Stanford-lectures, consisted of the students' attending a special half-hour lecture every other week for 10 weeks. Developed from material used in the Stanford Micro-Teaching project, the lectures emphasized the development of such teaching skills as reinforcement, varying the stimulus, set induction, use of examples, and closure. The third condition, sensitivity-lectures, also consisted of the students' attending a special half-hour lecture every other week for 10 weeks. These lectures emphasized the development of such teaching skills as awareness of student attitudes and feelings.

The conditions present under each of the eight treatments is presented in Figure 1. The symbol X indicates the presence of a condition; O, the absence of the condition.

	Method of Presentation		
Group	Micro-teaching	Stanford-lectures	Sensitivity-lectures
1	0	X	X
2	X	X	X
3	0	X	0
4	X	0	X
5	0	0	X
6	X	0	0
7	X	X	0
8	0	0	0

Figure 1. Treatment By Group

Criterion

The criterion measure was a test of teaching performance. At the close of the semester all students were taped giving a micro-teaching presentation. These tapes were reviewed and evaluated by two raters; these raters worked individually. The criterion score then was the average of these two ratings. The correlation between rater one and rater two was .647. The correlation between rater one and the composite rating was .928, and the correlation between rater two and the composite rating was .884.

Instruments

Data were collected concerning the learner characteristics listed below. Included with each of the caracteristics is the name of the instrument used for the measurement.

CHARACTERISTIC	INSTRUMENT
1. Attitude	1. Minnesota Teacher Attitude Inventory, Psychological Corporation, 1953.
2. Anxiety	2. Taylor Manifest Anxiety Scale (Taylor, 1953) Test Anxiety Scale (Sarason, 1961)
3. Divergent Thinking	3. Alternate Uses (Wilson, Christensen, Merrifield, and Guilford, 1960) Creativity Self-rating: Factor 1- Cognitively complex, Innovative, Curious, Factor 2 - Risk Taker, Impulsive, Adventurer, Fault Finder, Unconcerned with how other people view him (Torrance, 1962, Feldhusen, Denny and Condon, 1965)
4. Interest	4. Vocational Interest Analysis, Personal-Social Analysis, California Test Bureau, 1951.
5. Personality	5. Guilford-Zimmerman Temperment Survey, Sheridan Supply Company, 1949.
6. Values	6. Allport-Vernon-Lindzey Scale of Values, Houghton Mifflin Company, 1960.

Analysis of the data

The data were analyzed with a 2 x 8 analysis of variance design. The two independent variables were student characteristic and method. The scores on each test were used to dichotomize the subjects into a high and a low group, and there were 8 treatment conditions. The anova was thus 2 x 8 and provided tests of main effects of method and student variables as well as the interaction. Alpha was set at .05.

RESULTS

Interactions

The results showed that there were significant interactions of method of training with student variables only for the learner variables objectivity and social values. Students who were low in objectivity performed better in microteaching under treatment 2 (micro-teaching, Stanford-lectures, sensitivity-lectures) than did high objective students under treatment 2. Students who were low in social values performed better in microteaching under treatment 3 (Stanford-lectures) than did high people under treatment 3. A summary of the significant analyses of variance is given in Table 1; a summary of means comparisons is given in Table 2.

Treatment

The results also revealed that there were significant differences among the teacher training methods. Students in groups 6 (micro-teaching) and 2 (micro-teaching, Stanford-lectures, sensitivity lectures) performed consistently better in microteaching than did students in groups 4 (Stanford-lectures, sensitivity-lectures) and 8 (control). When the overall F ratio was

significant, a conservative individual degree of freedom test was used to determine where differences existed; in some instances this test would not reveal where the differences existed. Significant results are given in Table 1. Means comparisons are presented in Table 2.

Characteristics

The results further showed that there was a significant difference between people high and low in flexibility. People high in flexibility performed better in micro-teaching than did low people. Significant results are shown in Table 1 and means comparisons are given in Table 2.

DISCUSSION AND CONCLUSIONS

The first question to which this research was directed is stated as follows: Does each of the following learner characteristics, taken individually, interact with the method of teacher training to produce differential levels of micro-teaching performance: creativity, vocational interest, attitude toward teaching, general anxiety, test anxiety, values, and personality characteristics? The results showed that there were significant interactions of method of training in micro-teaching with learner variables for the following learner variables: objectivity, and social values.

For objectivity the subjects in treat 2 (micro-teaching, Stanford-lecture, sensitivity-lecture) who were low on objectivity performed significantly better in micro-teaching than did those subjects who were high on objectivity. An individual who scores low on objectivity is described as being near the subjectivity-hypersensitiveness end of the scale. Perhaps such individuals felt a greater need to perform well in the micro-teaching session because of their hypersensitive feelings, and therefore made a greater effort to learn and use the information which they received in the (Stanford sensitivity) lectures and for preparing and teaching lessons.

Subjects under treatment 3 (Stanford-lectures) who scored low on the social values performed better in micro-teaching than did those who scored high on the social scale. According to the manual for the Allport-Vernon-Lindzey Scale of Values the social individual loves people and regards persons as ends. Perhaps those persons who do not hold such a view of life were better able to benefit from the Stanford-lecture treatment in which they received concrete examples about the use of such techniques as the use of reinforcement, set induction, closure, and etc. Perhaps such persons were able to enter the relatively novel situation of micro-teaching without becoming overly concerned with the other people involved. Therefore, they were able to make fuller use of their background and abilities in presenting the lesson. The reverse situation may have been true for those persons who were high on the social value scale. These individuals because of their strong humanistic interest in and love for people may have been somewhat distrubed about manipulation methods and distracted from the actual presentation of the lesson. Therefore they were not rated as high in

micro-teaching performance as were those people who were low on the social value scale.

The second question to which the research was directed is stated as follows: Are there differences among the eight teacher training methods which result in different levels of micro-teaching performance? The results showed that there were significant differences among teacher training methods: 6 (micro-teaching) and 8 (control) and 2 (micro-teaching, Stanford-lecture, sensitivity-lecture) and 4 (micro-teaching, sensitivity-lecture). Across all analyses threr appeared a consistent pattern that persons in treatment 6 (micro-teaching) performed better than persons in treatment 8 and that persons in treatment 2 (micro-teaching, Stanford-lecture, sensitivity-lecture) performed better than persons in treatment 4 (micro-teaching, sensitivity-lecture).

Subjects in treatment 6 (micro-teaching) were involved in numerous micro-teaching experiences while people in treatment 8 (control) had only one such experience prior to the session in which they were rated; therefore, it is to be expected that those people in treatment 6 would do considerably better in the micro-teaching situation. The subjects in treatment 6 (micro-teaching) were quite were wuite familiar with demands of the situation and with the videotape equipment which was used in the session; therefore, it is reasonable to suspect that they were more relaxed and better able to present an effective lesson. However, subjects in treatment 8 (control) did not have the advantage of such previous experience to aid them in their performances. All of this means that controls should have had some warmup experience before the test recording. Subjects in treatment 2 (micro-teaching, Sensitivity-lectures, Stanford-lectures performed better in teaching than did subjects in treatment 4 (micro-

teaching and sensitivity lectures). These results seem to indicate that the information which students received in the Stanford lectures was of considerable value to the students when it was combined with the micro-teaching treatment. Perhaps the information given on such techniques as reinforcement, set induction, closure and others was well suited to the task of preparing and presenting effective lessons in a micro-teaching situation. It is also possible that subjects were better able to utilize the information given in the sensitivity lectures when they could combine this information with that of the Stanford lectures.

The third question to which the research was directed is stated as follows: Are there differences between high and low students on each learner characteristic in their performance in micro-teaching? The result showed that there was a significant difference between the high and the low people in flexibility. Those subjects scoring high on flexibility performed significantly better in micro-teaching than did those who scored low. This result is expected considering that the ability to produce new or categorically different ideas quickly and abundantly is an asset in the teaching situation. A person with such ability may be better able to attract and hold the attention of his students.

SUMMARY

Significant differences were found among several micro-teaching training methods. In general students who had micro-teaching as part of their training performed better on terminal tests of teaching ability than those students who did not. Students who were high on flexibility performed better across treatments than those who were not. Two significant interactions of treatment with training method were found. Students who were law in objectivity learned more in the treatment which involved all three training conditions than those who were high. Students who were low in social values learned more in the treatment which involved only a set of lectures based on Stanford micro-teaching concepts than those who were high in social values.

Table 1

Variable	Significant Results	F	Level of Significance
Guilford-Zimmerman objectivity	Treatment	3.01	.05
	Interaction	2.74	.05
Guilford-Zimmerman emotional stability	Treatment	2.56	.05
Guilford-Zimmerman personal relations	Treatment	2.65	.05
Allport-Vernon-Lindzey social values	Interaction	2.45	.05
Alternate Uses flexibility	High-Low	4.65	.05
Minnesota Teacher Attitude	Treatment	2.22	.05
Creativity Self-Rating factor 2	Treatment	2.39	.05

Table 2

Summary of Means and Standard Deviations for significant Results

Variable	Significant Results	Groups	Mean	SD
Guilford-Zimmerman objectivity	Treatment	6	52.42	6.51
		8	38.25	5.37
Guilford-Zimmerman Emotional Stability	Treatment	6	52.43	5.84
		8	38.25	5.19
Guilford-Zimmerman Friendliness	Treatment	6	52.42	14.84
		8	38.25	5.42
Guilford-Zimmerman Personal Relations	Treatment	6	52.42	6.51
			38.25	5.29
Minnesota Teacher Attitude	Treatment	4	39.17	39.17
		2	52.50	15.11
Creativity Self-Rating Factor 2	Treatment	4	39.17	8.20
		2	52.50	12.85
Guilford-Zimmerman Objectivity	Interaction	High 2	38.00	4.90
		Low 2	64.00	2.12
	Interaction	High 3		
Allport-Vernon	Interaction	High 3	31.75	9.54
Lindzey Social values		Low 3	46.00	5.93
Alternate Uses Flexibility	High-Low Split	High	46.52	10.41
		Low	42.02	9.77

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