DOCUMENT RESUME

ED 028 994 SP 002 596

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Pub Date Feb 69

Note-14p.; Paper presented at the annual meeting of the American Educational Research Association, Los Angeles, February 1969

EDRS Price MF-$0.25 HC-$0.80

Descriptors-*Academic Achievement, Education Courses, *Microteaching, *Teacher Attitudes

The effects of a microteaching experience on the achievement and attitudes of teacher candidates enrolled in a basic educational psychology course was investigated. A class of 137 students was randomly split into five discussion groups (which met once a week); the students of one group participated in microteaching-feedback-reteaching experiences (the MT group) while students in the other groups discussed tests, texts, and papers (control groups). Student achievement scores from papers and exams, student responses to items of the Purdue Rating Scale for Instruction (PRSI) for evaluating the overall course and instructor, and student responses to a discussion section evaluation questionnaire were each analyzed for differences between the control groups and the MT group. Results showed no significant differences in academic achievement between the two groups; significant differences for PRSI analyses--the MT group rated the overall course instructor less favorably and the laboratory aspects and relevancy of the course to teaching more favorably than did the control groups; and significant differences in questionnaire responses--the MT students perceived greater learning and course relevancy to teaching. (A nine-item bibliography is included.) (SM)

Student Attitudes and Achievement in an Educational Psychology Course after Micro-teaching[1]

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The training of teachers is an important function of the university. Traditionally, this training has involved courses in the subject matter to be taught, courses in the methods of teaching (sometimes involving observing ongoing classroom activities), courses in educational psychology and philosophy, and a student teaching experience in the senior year. Innovations in teacher education have been concerned with all of these areas of training at one time or another. However, even with the changes which have taken place, education students frequently express dissatisfaction with their training. Methods courses and courses in educational psychology and philosophy are seen as irrelevant by some students. The student teaching situation, while often viewed as the most relevant training, is at the same time seen by some as lacking real direction. One innovation which may offer valuable experience in teacher education is micro-teaching. Several studies have investigated micro-teaching in a variety of settings.

Micro-teaching was used successfully as a training device for teacher interns at Stanford University (Allen, 1966; Fortune, Cooper and Allen, 1967; and Cooper and Stroud, 1967). The original program involved the teaching of a short lesson, reviewing and reteaching. This was expanded in 1966 to include a series of seven lectures on teaching skills such as the use of

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[1] A paper presented at the annual meeting of the American Educational Research Association, Los Angeles, February 1969.

reinforcement, closure, examples and so on, in conjunction with seven coordinated, video-taped, micro-teaching experiences. Each micro-teaching experience consisted of the initial teaching of a 5 to 20 minute lesson with five or six high school students as an audience, playback with instructor critique, and reteaching. Participants in the program did change significantly from the initial teaching to the reteaching of several, but not on all of the skills being trained. There was a significant increase in the interns' self-perception of their teaching performance after the 8-week clinic. It was also found that the interns valued the micro-teaching experience highly and that they improved significantly in teaching ability as measured by the Stanford Teacher Competence Appraisal Guide in comparison with interns who did not have the micro-teaching experience.

In a study by Kallenbach (1968) a group of interns who did micro-teaching was compared to a group who did regular student teaching. When these interns were rated on their performance in a five-minute diagnostic lesson by expert judges using the Stanford Teacher Competence Appraisal Guide, no significant differences were found.

Goodkind (1968) reported similar findings in a study comparing students who micro-taught with students who student taught. He did suggest however that the micro-teaching group showed a greater awareness of their personal habits and mannerisms, teaching techniques, and the structuring and pacing of their teaching.

Young (1968) studied the effects of a model who exhibited teaching skills on the performance of teacher-trainees in a micro-teaching situation. He concluded that the presentation of a complete model of a teaching skill with specific illustrations does positively affect the behavior of teacher-trainees.

In summary, the set of experiences which are involved in micro-teaching has been shown to significantly affect teaching skills in the desired direction.

A change in the teaching performance of teacher interns has been found which is of similar magnitude to the change caused by student teaching. Students who micro-taught valued the experience highly and became more aware of their own personal characteristics in the teaching situation.

The purpose of this study was to assess the effects of a micro-teaching experience on the attitudes and achievement of students in an undergraduate educational psychology course. Of special interest to the authors was the question of what effect micro-teaching experience in an educational psychology course would have on student perceptions of the relevance of educational psychology to teaching.

Method

Subjects. The subjects were 137 undergraduates enrolled in the basic educational psychology course required of all teacher candidates. The class was randomly split into five discussion sections, one of which was randomly selected as the experimental group to receive the micro-teaching treatment (the MT group, N = 21). The other four groups served as controls and met for regular discussion sessions (C-1 through C-4, N = 30, 30, 27, 29, respectively).

Procedures. Students in the educational psychology course met two days a week for lecture, discussion, tests, and TV presentations. On Fridays four of the five discussion sections, the controls, met with discussion leaders to discuss text readings, the unit tests, and assigned papers. The experimental group met as a group and heard a brief lecture or participated in a micro-teaching experience. Different instructors handled each of the five groups.

Subjects in the MT Group were divided into two subgroups. While one subgroup was presenting in the micro-teaching situation, the other was listening to a short lecture or viewing a short demonstration on teaching skills. These lectures and demonstrations were patterned after those used

in the Stanford micro-teaching clinics (Allen, 1966). All of the demonstrations of teaching skills were presented by the MT discussion leader.

The subjects were asked to model their behavior after one or more of the demonstrations or lectures presented in the lecture portion. The micro-lessons were from five to eight minutes in length. The subjects taught materials from the textbook for the course (Cronbach, 1963) to the other members of their subgroup. Three to five students from each subgroup taught or retaught each week. All of the students participated in at least one teach-reteach sequence. Between the initial teaching session and the reteaching session the next week, the "teachers" met with the MT discussion leader and reviewed their tapes. During these review sessions attention was focused on examples of the skills the subjects stated they were attempting to portray. Attention was also focused on the effect of the "teacher's" performance on the audience and on the identification of points in the lesson where it might be appropriate to include further manipulations of the skills which had been discussed. The student was to attempt the suggested changes in the reteach session. After the reteach session a final reviewing session was held in which a subjective analysis of the success of the changes was made.

Instruments. The data for analysis were drawn from four major sources: the scores on four multiple-choice exams and their total; the scores on five narrative papers which dealt with instructional principles, teaching and evaluation, and empathy; the responses to each item of the Purdue Rating Scale for Instruction ; and a short questionnaire concerning subjects' evaluation of the discussion sections .

Analysis. Each test or paper score and the response to each of the items on the PRSI and the questionnaire were analyzed separately using a one-way

ANOVA program. If the obtained F-ratio was significant at the .05 level or beyond a Newman-Keuls test for ordered means (Winer, 1962) was run.

Results

The means and standard deviations used in all the analyses are found in Table 1.

Test results. The analyses of the scores on unit tests and the total test score indicated no significant differences between the MT group and any of the control groups.

Papers. The F-ratios for the analyses of three of the five papers were significant (see Table 2). On the first paper the MT group received significantly lower scores than one of the control groups (C-4). On the second paper three of the control groups (C-2, C-3, C-4) scored significantly higher than the MT group. Two of the control groups (C-2 and C-4) scored significantly higher than the MT group on the third paper. There were no significant differences between groups in the final two papers.

The PRSI. The PRSI means are reverse order scales. That is, the higher the mean, the poorer the rating. Of the eleven items on the PRSI which describe the overall course instructor (Items 1-10, and 26), significant differences among groups were found in all eleven analyses (see Table 2). In all but one case, item 2, the mean for the MT group was the highest, that is, the MT group tended to rate the overall course instructor poorer than the other groups. The MT group perceived the overall course instructor more poorly than at least two of the control groups in ten out of eleven analyses. The characteristics involved were interest in subject, sympathy toward students, fairness, liberalness, sense of proportion and humor, confidence, personal peculiarities, personal appearance, stimulating intellectual curiosity, and the overall rating of the instructor.

There were fifteen items on the PRSI on which various aspects of the overall course were rated. Of these, significant differences among groups were found in eight analyses. The MT differed significantly from two or more of the control groups on only three of these analyses. The MT group tended to rate the course significantly better with respect to the suitability of the methods by which the subject matter of the course was presented considering recitation, lecture, laboratory etc., the suitability of the laboratory facilities available for the course, and how the course was fulfilling the needs of the students considering their ultimate as well as immediate goals.

Questionnaire. The first item on the questionnaire asked students to estimate what percentage of the overall amount learned in the course was learned in their discussion sections. The MT group mean was significantly higher than the mean of three of the four control groups (see Table 2). One control group (C-4) differed significantly in a positive direction from two of the other control groups.

The second item on the questionnaire asked students to estimate what percentage of the amount they learned in the overall course, which they felt was directly relevant to teaching, was learned in the discussion sections. The MT group mean was significantly higher than the means of all four of the control groups (see Table 2). One of the control group means (C-4) was significantly higher than the means for the other three control groups.

When the subjects were asked to rate how much help they had received in their discussion sections relative to test and paper preparation, the MT group ratings tended to be lower. When preparation for tests was considered, the MT group mean was next to the lowest and differed significantly from one of the control groups (C-2). The MT group mean rating was lowest when help in preparing papers was considered. The four control groups differed significantly in a positive direction from the MT group on this variable.

The last item on the questionnaire asked subjects how likely they would be to repeat their discussion section experience on a non-credit basis. The MT group mean was significantly higher than all four control group means. The mean value for the MT group on this variable was 2.73 on a scale where two equaled "probably would not" and three equaled "probably would."

Discussion and Conclusions

The purpose of this study was to assess the effects of a micro-teaching experience on the attitudes and achievement of students in a basic educational psychology course. Of special interest was the question of what effect micro-teaching experience would have on students' perception of the relevance of educational psychology to teaching.

The performance of the MT group did not differ from that of the control groups on the objective tests given in the course. This was true even though the control groups spent some of their discussion sessions in preparing for tests. The control groups in general did not rate the help they received in their discussion groups in preparing for tests any higher than the MT group. For the first three of the series of five papers required for the course the MT group received lower scores than some of the control groups. The control groups spent the majority of their discussion sessions preparing to write the papers. This preparation appears to have had positive results over the first three papers. The lack of significant differences on the last two papers between the MT group and the control groups suggests that the MT subjects learned what was expected on the papers from the results on their first three papers. Subjects in the MT group indicated that they received less help on papers than the control groups. In light of no significant differences involving the MT group on the last two papers and the pattern of the differences on the paper scores, it is concluded that the time spent in the micro-teaching experience

did not result in a significant overall decrease in the amount of content learned.

When the subjects were asked to rate various characteristics of the overall course instructor and the course in general, an interesting pattern emerged. The MT group rated the overall course instructor poorer than at least two of the control groups on ten out of eleven items. When considering the course itself, the MT group gave higher ratings than the control groups to those aspects of the course having to do with laboratory facilities, how well the course was meeting their ultimate and immediate goals, and the presentation of subject matter (in lectures, recitation, and laboratory). It appears that the activities of the micro-teaching experience caused some of the other activities of the course, and especially the course instructor, to be valued lower. The micro-teaching experience was valued significantly above the experiences of the other discussion groups in which subjects discussed the textbook material, unit tests, and papers.

Subjects in the MT group felt that they learned a significantly greater amount in their discussion group compared to three of the four control groups. This difference became more pronounced when the amount learned in the discussion groups was considered with respect to relevance to teaching. The MT group estimated that they learned 80% of the material learned in the course relevant to teaching in their discussion group compared to 40% for the highest control group (the range was from 10% to 40% for the control groups). The MT group indicated that they "probably would" want to become involved in a situation like the micro-teaching experience again even on a non-credit basis. The four control groups indicated that they "probably would not" or definitely would not."

It is concluded that a micro-teaching of experience of the nature described is an important adjunct to the educational psychology course. Subjects tend to perceive such an experience as valuable and relevant to their teaching goals.

Table 1

Means and Standard Deviations for the Tests, Student Papers, Questionnaire, and PRSI

	MT		C-1		C-2		C-3		C-4	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Tests										
1	31.76	7.21	29.90	5.38	27.77	5.58	34.93	6.36	31.79	5.00
2	34.24	6.18	29.97	5.93	33.73	5.39	33.41	7.03	31.83	6.29
3	39.19	6.01	35.47	5.48	38.37	4.32	39.04	7.10	37.48	5.81
4	33.90	5.09	32.03	5.51	30.70	7.19	34.78	6.96	33.14	6.06
Total	139.10	20.26	127.40	18.41	133.40	17.90	141.44	23.70	134.20	19.50
Student Papers										
1	10.52	4.21	9.47	4.68	10.97	5.16	7.93	3.50	13.55	3.56
2	9.67	4.88	10.93	4.31	13.70	7.07	13.30	2.96	14.07	4.06
3	11.00	3.89	10.53	4.86	14.90	5.44	11.37	1.60	15.00	3.08
4	14.00	6.40	14.20	3.79	15.90	6.02	13.44	2.67	15.38	4.28
5	16.14	4.49	16.17	3.80	17.07	6.86	16.07	4.26	17.76	5.10
Questionnaire										
Item 1	40.31	25.46	16.08	12.37	24.54	17.10	11.06	11.56	31.14	26.94
Item 2	79.93	16.55	18.24	15.93	23.91	16.65	10.06	14.87	40.19	30.72
Item 3	3.13	.50	3.52	.65	3.92	.81	3.06	.73	3.61	.78
Item 4	2.50	.52	4.04	.84	3.96	.89	3.50	.86	4.22	.85
Item 5	2.73	.88	1.80	.76	1.88	.67	1.33	.59	1.57	.59
PRSI										
Item 1	3.44	1.36	2.58	1.21	2.96	1.71	2.44	1.10	2.29	1.00
Item 2	3.63	1.71	2.88	1.60	3.44	1.78	2.22	1.26	1.58	1.14
Item 3	2.81	1.22	3.00	1.38	2.80	.87	2.28	1.02	1.75	1.07
Item 4	4.38	1.63	3.71	1.43	3.24	1.13	2.78	1.56	1.83	1.05
Item 5	7.69	1.62	6.91	1.88	6.76	1.48	6.12	2.78	3.88	2.07

	MT		C-1		C-2		C-3		C-4	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Item 6	6.00	1.46	4.54	2.00	5.40	1.44	3.78	1.86	3.00	2.00
Item 7	6.19	1.52	5.52	2.22	5.50	1.67	3.78	2.49	2.83	1.63
Item 8	5.00	1.55	3.88	1.90	3.92	1.93	3.44	2.01	2.33	1.58
Item 9	2.44	1.41	2.08	1.25	2.17	.92	1.56	.92	1.42	.72
Item 10	6.94	2.02	6.25	2.09	6.17	1.71	5.39	1.69	3.63	1.56
Item 11	2.44	1.15	3.28	.79	3.36	.91	3.65	.86	3.52	1.20
Item 12	2.38	1.09	2.60	1.08	2.88	.93	2.18	1.01	2.70	.93
Item 13	3.00	1.03	2.63	.92	3.48	1.23	3.29	.92	3.43	1.16
Item 14	3.13	1.20	3.16	1.03	3.60	1.19	3.35	1.00	3.91	1.04
Item 15	3.19	1.17	2.96	1.17	2.84	1.07	2.65	1.00	3.22	1.09
Item 16	1.69	.79	2.94	1.20	3.05	.79	2.93	.80	3.67	1.03
Item 17	2.69	1.01	2.56	1.00	2.36	.70	2.71	1.05	3.26	1.05
Item 18	3.50	1.03	3.20	1.04	2.84	1.14	2.71	.92	3.57	1.20
Item 19	3.38	.89	3.60	1.12	3.40	.82	3.41	1.06	3.83	1.03
Item 20	2.56	.89	3.76	1.05	3.64	.86	3.47	.80	4.00	.95
Item 21	2.56	.63	2.88	.60	2.76	.60	2.88	.49	2.96	.47
Item 22	3.38	1.20	3.33	.92	3.44	.87	3.29	.85	4.17	.89
Item 23	2.81	.54	2.72	.68	2.68	.63	2.88	.49	3.04	.71
Item 24	3.13	.72	2.88	.78	3.08	.76	2.76	.66	3.57	1.04
Item 25	2.31	.79	2.52	.65	2.33	.70	2.59	.71	2.78	.74
Item 26	4.06	.77	3.46	.98	3.50	.66	3.12	.99	2.35	1.03

Table 2

Summary of Analyses of Variance for 41 Criterion Variables Across Treatments

Criteria Variable	df	F[1]	p	Ordered Test[2]
Test Scores				
Test 1	4,132	3.55	.01	C2, C1<C3*
Test 2	4,132	2.22	N.S.	
Test 3	4,132	1.94	N.S.	
Test 4	4,132	1.81	N.S.	
Test 5	4,132	2.06	N.S.	
(Total of 4 unit tests)				
Paper Scores				
Paper 1	4,132	6.60	.001	C3, C1<C4**
Paper 2	4,132	3.91	.01	MT<C3, C2, C4*
Paper 3	4,132	8.31	.001	C1, MT, C3<C2**; C1, MT, C3<C4**
Paper 4	4,132	1.28	N.S.	
Paper 5	4,132	.60	N.S.	
PRSI Items (note: on these items the lower the mean the better the rating).				
1. Interest in subject	4,102	2.93	.05	C4, C3<MT
2. Sympathetic Attitude toward students	4,102	6.73	.01	C4<C1*, C4<C2, MT** C3<C2, MT*
3. Fairness in Grading	4,102	4.79	.01	C4<C2, MT, C1**, C3<MT, C1**
4. Liberal and Progressive Attitude	4,102	8.20	.001	C4<C3*, C4<C2, C1, MT**; C3<MT*
5. Presentation of Subject Matter	4,100	11.77	.001	C4<C3, C2, C1, MT**
6. Sense of Proportion and Humor	4,102	9.38	.001	C4<C1*; C4<C2, MT**; C3<C2*, C3<MT**; C1<MT*
7. Self-reliance and Confidence	4,102	11.08	.001	C4<C2, C1, MT**; C3<C2, C1*; C3<MT**
8. Personal Peculiarities	4,101	5.69	.001	C4<C1, C2**, C4<MT**, C3<MT*
9. Personal Appearance	4,101	3.37	.05	C4, C3<MT*

Table 2 (Continued)

10.	Stimulating Intellectual Curiosity	4,101	10.69	.001	C4<C3, C2, C1, MT**; C3<MT*
11.	Suitability of methods by which course is presented	4,101	3.89	.01	MT<C1, C2*; MT<C4, C3**
12.	Suitability of class size	4,101	1.49	N.S.	
13.	Clarity of objectives	4,100	2.58	.05	
14.	Agreement between objectives and course	4,101	1.97	N.S.	
15.	Suitability of reference material	4,101	.90	N.S.	
16.	Suitability of lab facilities	4,83	9.93	.001	MT<C3, C1, C2, C4**
17.	Suitability of Text-book	4,101	2.87	.05	C2<C4*
18.	Use of test as aids to learning	4,101	2.50	.05	
19.	Freedom allowed students in selection of materials to be studied	4,101	.81	N.S.	
20.	How course fulfills needs	4,101	6.33	.001	MT<C3, C2, C1, C4**
21.	Range of class ability	4,101	1.37	N.S.	
22.	Suitability of work assigned	4,100	3.40	.05	C3, C1, MT, C2<C4*
23.	Weight given to test	4,101	1.25	N.S.	
24.	Coordination of test with course objective	4,101	3.06	.05	C3, C1<C4*
25.	Frequency of test	4,100	1.56	N.S.	
26.	Overall rating of instructor	4,99	8.03	.001	C4<C3, C1, C2, MT**; C3<MT**
Questionnaire responses					
1.	Percent learned in discussion section	4,99	6.47	.001	C3<C4, MT** C1<C4*, C1<MT** C2<MT*

2.	Percent of Teaching Relevant Material Learned in Discussion Section	4,94	29.42	.001	C3, C1, C2, C4<MT** C3, C1<C4**; C2<C4*
3.	Help in preparing for tests	4,102	5.12	.01	C3, MT<C2**
4.	Help in preparing papers	4,102	12.81	.001	MT<C3, C2, C1, C4** C3 C4*
5.	Desire to repeat discussion section on non-credit basis	4,101	9.42	.001	C3, C4, C2, C2<MT**

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[1]The F-ratios reported are for the between groups variance divided by the within groups variance.

[2]The results of Newman-keuls tests for ordered means are reported in this column. The notation MT<C4 means that the mean of the MT group was significantly lower than the mean of the C4 group.

*P<.05

**P<.01

***P<.001

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