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ABSTRACT

A study investigated whether teachers who receive training and then implement more effective instructional practices change in the reasons they offer for their effectiveness. Comparisons were made between 46 intermediate and high school teachers in a large urban school system who were trained in and implemented mastery learning techniques, and 50 similar teachers who could not be included in the training. A questionnaire was administered to both groups before and after the training. Results of a multivariate analysis of variance showed that the mastery learning teachers attached increased importance to teaching practices and behaviors in explaining their effectiveness after they had implemented these techniques. Furthermore, there was a significant reduction in the importance mastery learning teachers attached to personality factors. The implications of these findings for staff development are discussed. (Author/JMK)

THE EFFECTS OF MASTERY LEARNING ON THE REASONS TEACHERS GIVE FOR THEIR EFFECTIVENESS IN THE CLASSROOM

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Abstract

This study was designed to investigate whether teachers who receive training and then implement more effective instructional practices change in the reasons they offer for their effectiveness. Comparisons were made between 46 teachers who were trained in and implemented mastery learning techniques, and 50 similar teachers who could not be included in the training. The results of a multivariate analysis of variance showed that the mastery learning teachers attached increased importance to teaching practices and behaviors in explaining their effectiveness after they had implemented these techniques. Furthermore, there was a significant reduction in the importance mastery learning teachers attached to personality factors. The implications of these findings for staff development are discussed.

The Effects of Mastery Learning on the Reasons Teachers Give for Their Effectiveness in the Classroom

Teachers usually offer a wide variety of reasons when asked to explain their effectiveness in the classroom. Some of the reasons they offer typically describe personal characteristics or aspects of their personalities. Other reasons describe particular teaching practices and behaviors. While both personality and behavior factors are important under certain conditions, research has shown that teaching practices and behaviors are generally more strongly and more consistently related to student learning and, hence, to teachers' effectiveness in the classroom (Brophy, 1979; Guskey & Easton, 1983; Medley, 1977). As a result, teaching behaviors are the focus of the vast majority of instructional improvement programs. In most cases these efforts are designed to help teachers make specific changes in their classroom behaviors in order to enhance the learning of their students (Stallings, 1980).

Although many studies have investigated the success of various instructional improvement programs in helping teachers to make specific changes in their teaching, few have assessed the concomitant effects these efforts might have upon teachers. There is some evidence that indicates when teachers adopt more effective instructional practices

and gain evidence of increased learning among their students, they accept greater personal responsibility for their students' learning and they feel more positively about teaching (Guskey, in press). Other research has shown that under similar conditions, teachers are also less able to accurately predict their students' level of achievement, presumably because more of their students learn quite well as a result of their teaching (Guskey, 1982). But relatively little is known about the effects of such efforts or teachers' explanations for their effectiveness. That is, when teachers become more effective as a result of making specific changes in their teaching, do they then explain their effectiveness differently?

This study was designed to investigate the effects of an instructional improvement program and the implementation of new instructional techniques on teachers' explanations of their effectiveness in the classroom. It was hypothesized that as teachers learn about and adopt more effective instructional practices, the reasons they give for their effectiveness will reflect a stronger emphasis on teaching behaviors and a diminished emphasis on factors related to their personal characteristics or personalities.

Theoretical Framework

Over the past decade a wide variety of preservice and inservice education programs have been specifically devised to enhance the instructional effectiveness of teachers. Some of the most successful among these are programs associated with mastery learning instructional strategies (Bloom, 1968, 1976). A key element in the mastery learning process is the use of feedback and corrective activities with each instructional unit. Under mastery learning, students are provided with regular checks on their learning progress (feedback) in the form of short quizzes or "formative" tests. These checks are then paired with specific corrective activities that are designed to help students remedy any learning difficulties they may be experiencing. With the provision of carefully planned feedback and appropriate corrective activities, mastery learning theory suggests that 80 percent of students may reach the same high level of achievement attained by only 20 percent of students under more traditional approaches to instruction. And indeed, reviews of mastery learning research indicate that these strategies can aid teachers in dramatically altering the learning and resultant achievement of students in their classrooms (Block & Burns, 1976).

In this study the introduction of mastery learning was employed as the means of improving the instructional effectiveness of teachers. Attention was then focused on

the changes these improvements might bring about in the explanations teachers give for their effectiveness in the classroom.

Method

Subjects

The subjects in this study were 96 intermediate and high school teachers from a large urban school system. All of these teachers volunteered to participate in an inservice education workshop on mastery learning. For their participation teachers were to be granted release time and receive salary lane-placement credit. The major teaching assignments of these teachers were in the areas of language arts, mathematics, science, social studies, and foreign language (French and Spanish).

Because of limited resources, not all of these volunteers could be included in the workshop. Therefore, 46 teachers from schools with the largest number of teachers volunteering were selected to participate in the workshop. The remaining 50 teachers were guaranteeded priority in selection for future training workshops. Those teachers not selected served as the control group for the study.

The 46 selected teachers were fairly evenly dispersed among the subject areas. All had taught at the intermediate or high school level for at least 3 years. The average

number of years teaching experience was 10.3. The 50 teachers in the control group were comparably dispersed among the subject areas and were similarly experienced (average = 10.0 years).

Procedure

When they initially applied to participate in the workshop, all 96 teachers were sent an information package and a brief questionnaire. In addition to demographic data, one section of the questionnaire asked the teachers to rate 20 statements on a five-point Likert scale. The statements concerned factors possibly related to a teacher's effectiveness in the classroom. Ten of the statements were related to particular personality characteristics and ten concerned specific teaching behaviors (see Appendix). Teachers were assured that their responses to these statements would be confidential and would have no bearing on their selection for the workshop.

Six months later, after the teachers who participated in the workshop had an opportunity to implement the mastery learning techniques in their classes for one semester, the same questionnaire was administered again to all teachers. Again, the implementation of mastery learning involved primarily the regular use of formative tests paired with specific corrective activities. Teachers' ratings from the two administrations of the questionnaire constituted the major data for the study.

Results

The first step in analyzing the data was to calculate reliability indices for the measurement scales. Since the questionnaire was designed to measure teachers' ratings of the importance of both personality and behavior factors, separate reliability coefficients were calculated for personality scale items and for behavior scale items. Cronbach alpha coefficients for pre- and post-treatment administrations of personality scale items were .836 and .871, respectively. For pre- and post-treatment administrations of behavior scale, they were .858 and .861, respectively. These coefficients indicate that both scales yielded fairly reliable measures on each administration.

The next step was to calculate means and standard deviations of the various measures. These are illustrated in Table 1. A quick inspection of these means reveals that initial differences between mastery and control teachers were very slight. However, mastery teachers do appear to attach increased importance to behavior factors after having implemented mastery learning.

Insert Table 1

Correlations were then calculated between the measures for both pre- and post-treatment administrations of the scales. These are illustrated in Table 2. The correlation

coefficients show that the measures are all moderately correlated, probably because of conceptual similarities.

Insert Table 2

Next, differences between mastery and control teachers were tested through multivariate analysis of variance (MANOVA) procedures. In order to precisely test for differences between these groups over time, it was necessary to first transform the original measures. This was required because of the within-subjects design with respect to the time factor (Finn, 1977). The transformations were conducted in the following manner. First, the pre- and post-treatment scores for both the personality and behavior scales were summed. These summed variables (SUM-PER and SUM-BEH) provided the tests for the main effects of the treatment. Then the pre-treatment scores were subtracted from the post-treatment scores to yield a pre-post difference. These difference variables (DIFF-PER and DIFF-BEH) provided the tests for the treatment-by-time interaction, the principal test of interest for the study. In the MANOVA procedures, the four transformed variables were employed as the set of dependent measures, while treatment was considered the single design factor.

The results of the MANOVA procedure are shown in Table 3. The multivariate F-statistic for the model is statistically

significant, indicating that there are significant differences between the mastery and control groups of teachers. Where these differences lie can be seen by inspecting the univariate tests. These show that the difference between the groups is due primarily to the increased importance mastery teachers attached to behavior factors (the DIFF-BEH test). Undoubtedly, this increase also accounts for the significant main effect test of group differences on the behavior measure (SUM-BEH). Also significant, however, is the test of the change in importance attached to personality factors (the DIFF-PER test), apparently due to the decline in mastery teachers' ratings.

Insert Table 3

Discussion

The purpose of this study was to investigate whether teachers who receive training and then implement more effective instructional practices in their classrooms change in terms of the explanations they offer for their effectiveness. The results show that after implementing mastery learning techniques in their classrooms, teachers do attach significantly greater importance to behavior factors in explaining their effectiveness and also attach less

importance to personality factors. Apparently teachers who implement these more effective instructional practices come to believe that behavior factors are of greater importance and personality factors are of somewhat less importance to their effectiveness in the classroom.

These findings have important implications for staff development efforts. Personality factors tend to be very stable among adults and highly resistant to change. Teachers who explain their effectiveness in the classroom primarily in terms of personality factors are thus likely to view the prospects of change or improvement rather pessimistically. Such teachers would probably be reluctant to participate in instructional improvements that focus on teaching behaviors and will need to be helped to see the importance of specific teaching practices.

On the other hand, behavior factors are far less stable and less resistant to change. Teachers who explain their effectiveness primarily in terms of behavior factors are therefore likely to be more optimistic regarding change and improvement. Furthermore, teachers who implement techniques such as mastery learning and, as a result, come to attach greater importance to behavior factors, would probably be more conscious of their teaching behaviors and more inclined to explore additional ways their behaviors might enhance student learning.

The external validity of these results is limited to some degree due to the design of the study. Specifically, all of the teachers included in the study volunteered to participate in an inservice workshop and, therefore, the findings are applicable only to similar volunteers. In addition, the sample included only intermediate and high school level teachers and cannot be generalized to teachers in the elementary grades. Hence, further studies involving a broader range of teachers are necessary.

Additional research on teacher change is certainly needed. In particular, research on ways to motivate and stimulate teachers to make important changes in their classroom practices and teaching behaviors is essential. Hopefully this study provides a useful first step for those efforts.

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Table 1

Means and Standard Deviations of Variables by Treatment Group

Variable	Mastery (n = 46)		Control (n = 50)	
	$\bar{X}$	(SD)	$\bar{X}$	(SD)
Pre-Personality	39.82	(3.41)	39.21	(3.27)
Pre-Behavior	40.21	(3.31)	40.70	(3.09)
Post-Personality	38.29	(4.23)	39.59	(3.45)
Post-Behavior	43.43	(3.56)	40.14	(2.90)

Table 2

Intercorrelations Among the Variables
(n = 96)

Variable	Pre-Per	Pre-Beh	Post-Per	Post-Beh
Pre-Per	1.000	.307	.468	.256
Pre-Beh		1.000	.362	.518
Post-Per			1.000	.207
Post-Beh				1.000

Table 3

Summary of MANOVA Results on Transformed Variables

Source	df	Multivariate F	Univariate F's			
			SUM-PER	DIFF-PER	SUM-BEH	DIFF-BEH
Constant	1	-	-	-	-	-
Treatment	1	10.68**	.30	6.29*	5.99*	34.35**
Residual	94	Mean Squares	37.91	13.89	31.38	9.96

* $p < .05$
** $p < .01$

APPENDIX

Questionnaire on Teaching Effectiveness

Directions: For each of the following statements, please mark how important you feel it is to the effectiveness of a teacher. Place the number of the response which comes closest to your feelings on the blank in front of the statement.

Completely Unimportant				Extremely Important
1	2	3	4	5

____ 1. Students find the teacher very kind and likeable.
b___ 2. The teacher's instructional materials are well organized.
____ 3. Students believe the teacher is conscientious.
____ 4. The teacher is a forthright individual.
b___ 5. The teacher's classroom procedures are orderly and business-like.
b___ 6. The teacher uses classroom time effectively.
b___ 7. All students are actively involved in the instruction by the teacher.
____ 8. Students feel the teacher is a warm and caring person.
b___ 9. The teacher rewards students for completing their work.
b___ 10. The teacher insists that students correct all of their learning errors.
b___ 11. The teacher plans lessons very carefully.
____ 12. The teacher is open and friendly to students.
____ 13. The teacher is an even-tempered individual.
b___ 14. The teacher encourages all students to participate in the class.
____ 15. Students believe the teacher is authentic.
b___ 16. The teacher regularly checks on each individual's learning progress.
____ 17. Students feel the teacher is an understanding person.
b___ 18. The teacher regularly reviews difficult concepts.
____ 19. Students see the teacher as sympathetic.
____ 20. The teacher is accepting of student's personal feelings.

b = behavior items