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ABSTRACT

The relative impact on students of small group instruction versus individualized instruction and the impact of intensive training consulting with teachers around an innovative instructional approach on subsequent use of that approach were investigated. A large-scale 10-week experiment involving 57 classes and 19 teachers in a 2 x 2 quasi-experimental design was conducted with 1,187 students involved in seventh and eighth grade language arts classes. The small group instructional approach created greater achievement on a treatment-specific measure of language arts skills and a marginally positive effect on student self-concept regarding peer relationships. (Although data was collected in 1976 for this study, the review of the literature dates through 1979.) (Author)

Small Group Versus Individualized Instruction: A Field Test of Their Relative Effectiveness[1]

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INTRODUCTION

What is the relative impact of a small-group instructional technique when compared with individualized instruction, an approach employing dramatically different learning structures. Must new classroom techniques be introduced to the teacher in the costly form most pilot programs take, or can they be disseminated in a less personal way? This study focused on these issues through a large-scale field test involving 1,187 junior high school students from three school systems in a ten-week treatment. The issues addressed by the field experiment are elaborated below:

Small Group vs. Individualized Instruction

One instructional approach which has received considerable attention in the educational community recently involves the recognition of differences across students in their entry level skills in any subject area and the importance of tailoring the instructional materials and experiences to those differences. This approach has been articulated under several headings, including mastery learning (Block, 1971), Computer Assisted Instruction (Atkinson, 1968), and Individually Prescribed Instruction (Glaser, 1968). Conceptually, the strength of individualized instruction is the focusing of (1) the instructional objectives to be taught, (2) the procedures which allow the student to acquire the skills at individually adjusted rates, and (3) the basis for evaluating competence skill area, on each individual student, creating a highly responsive instructional climate.

Another set of highly related instructional approaches described recently in the educational literature involves small group, or team learning. Several recent reviews of this literature (Michaels, 1977, Slavin, 1977, Johnson & Johnson, 1974) have elaborated the structural

changes in the classroom instructional setting created by small-group learning, and have cited extensive empirical literature providing some evidence of their relative impact on both classroom processes and outcomes (such as achievement). In contrast to individualized instruction, small-group learning approaches avoid atomizing the classroom by creating separate learning environments for each student. Rather, they create performance of teams of students (with the teams often comprised of students with different academic abilities), and reinforce performance at the small-group, as well as individual level.

The present study focuses on one team technique, Teams-Games-Tournament (TGT), as defined by DeVries & Slavin (1978). TGT can best be explained by describing each of its three elements:

Teams. Students are assigned to four- or five-member teams. Each team contains as much diversity as the classroom allows on such factors as academic achievement, race, and sex. Ideally, each team would have one high achiever, two average achievers, and one low achiever. However, the teams are organized so that each team is approximately equal in overall achievement. Throughout the period of time when TGT is used, team membership remains intact. Each team has regular practice (or peer tutoring) sessions during which teammates help each other review skills taught by the teacher.

Tournament. The teammate practice sessions prepare the student for game sessions in an ongoing tournament. In the tournament, which takes place once or twice each week, each student is assigned to a tournament table where he or she competes individually against students from other teams. The students at each tournament table are roughly comparable in achievement level. The tournament tables are numbered with Table "1"

being the "top" table. At the end of the period, the players at each table compare their scores to determine the top, middle, and low scorers at the various game tables. The top scorer at each table receives six points, the middle scorer four points, and the low scorer two points. Team scores are then calculated by simply adding the results for teammates. These scores are added to the team's tallies from previous game sessions in the tournament, creating a cumulative score. Team standings are then compiled and shared with the students. The results are publicized in a weekly classroom newsletter.

Games. Skill exercise sessions which focus on the current subject matter are played during the tournament. At each three-person game table, students answer questions posed on card sets or game sheets to demonstrate mastery of specific skills. A basic set of rules, including a challenge rule, dictates the form of play.

A more comprehensive description of TGT is contained in Slavin (1978).

The TGT literature contains a relatively large number of empirical tests of its efficacy (particularly compared with "traditional" instructional approaches [DeVries & Slavin, 1978]). What remains unanswered is how the impact of TGT on students compares with other innovative instructional approaches, particularly one which makes considerably different assumptions regarding learning environments necessary to create student learning. The present study seeks to fill that void.

Teacher Training: Level of Intensity

Many empirical tests of instructional approaches, even when done in the field, rely on an intensive teacher training effort and rather frequent

monitoring of teacher implementation and general problem-solving consultation with the teacher. Such investment in teacher training is unlikely to occur in any naturalistic and widespread dissemination of any classroom technique. The present study asks whether the claimed impacts of TGT and/or individualized instruction depend on intensive teacher training and monitoring.

A corollary issue is whether TGT requires more or less intensive training of teachers than does an individualized instruction. The introduction of either strategy into a classroom requires substantial changes in classroom management practices. Nevertheless the question is of interest in an overall evaluation of these two instructional techniques.

METHOD

Design

In an attempt to answer the two issues cited above, a 2 x 2 quasi-experimental design was created (see Figure 1). The experiment was conducted over a ten-week period during the fall of 1974. Pre- and post-test measures were obtained of all dependent variables.

Insert Figure 1 About Here

The teachers were selected from three school systems, all from one metropolitan area in the Midwest. To identify teacher participants, the study was explained to administrators and language arts committees from the three school systems. After deciding to participate, the systems notified all their junior high school language arts teachers of the project and asked for their participation. Each teacher volunteer was asked to select three of his/her language arts classes to be in the study (volunteers were excluded if they taught fewer than three language arts classes).

Teachers (not classes) were randomly assigned to one of the four treatment groups in a stratified random manner. Stratification occurred by school system (public, private, and parochial) and grade level (seventh vs. eighth). This nesting of teacher within treatment, while not desirable methodologically, was viewed by the experimenters as a necessary part of a "close-to-reality" adoption strategy. Asking each teacher to master both the small group and individualized approaches and apply both to different classes would have required the intense supervision of treatments associated with laboratory studies. As noted later, the nesting does require the treatment of "teacher effects" as residual or error variance.

Treatments

I. TGT/Workshop & Consulting:

Every teacher was asked to conduct his/her language arts classes around standard TGT practices (see Slavin, 1978). Twenty-two TGT instructional games were designed around the instructional objectives (see below) and given to each teacher. Teacher training involved participation in a three-hour TGT workshop and three consulting visits by one of the authors during the 10-week implementation period. The workshop had been pilot tested by the authors with teachers from other school systems and focused on acquainting the teachers with both the mechanics and rationale of TGT.

II. Individualized Instruction/Workshop Consultation:

One commercially available language arts program which provides materials and a rationale for a highly individualized approach is the "Random House English Series" (RHES) published by Random House. The selection of the RHES approach was made after a thorough review of extant commercially produced programs for language arts. Each teacher was given a complete set of RHES materials and attended a three-hour workshop covering use of the materials

and larger management issues involved in individualized instruction. Additionally, each teacher was visited three times for consultation.

III. TGT/Written:

This treatment was defined similarly to treatment I, with each teacher receiving all TGT materials at the beginning of the ten-week period. The only other contact with the authors involved distributing the pre- and post-tests.

IV. Individualized Instruction/Written:

This intervention was similar to III, with each teacher receiving complete packet of RHES materials and the publisher's teacher manual. The only other contact with the authors involved distributing the pre- and post-tests.

Instructional Content:

The curriculum for the ten-week period was designed from the existing Random House English Series, with a cross-checking for the relevance of the specific objectives with a subset of the participating teachers. The curriculum objectives were divided into nine basic clusters, with every treatment group taught the same overall objectives set. The objectives included, among others, use and identification of nouns, verbs, adverbs (e.g., "Given a paragraph, a student will identify the adverbs and the words they modify." "Given an incomplete sentence containing a choice between an adjective and an adverb to complete it, the student will select the correct word.").

Dependent Variables--Measures

To test for the relative efficacy of the two instructional approaches various outcome measures were employed. The present report focuses on two measures of academic achievement and two self-concept scales.

Standardized Language Arts Achievement Test: After reviewing Buros (1972) for standardized language arts tests which meet minimal psychometric

criteria, the authors selected the Hoyum-Sanders Junior High School English Test. The Hoyum-Sanders is a 135 item, multiple-choice test which measures competence in eight skill areas within language arts. A test score was generated for each student at both pre-test and post-test times.

Treatment-Specific Achievement Test: A commonly noted difficulty in using standardized achievement tests as measures of classroom intervention effects involves the relevance of the skill areas measured. Typically the standardized test is designed to tap the entire domain of skills, whereas interventions focus on only a subset of the skills. Consequently, the measure may prove to be "insensitive" to the treatment effect because it (1) measures skills not addressed by the intervention, and (2) only briefly (and perhaps less reliably) measures those skill areas addressed. This is certainly true for the Hoyum-Sanders and prompted the design of a 48-item multiple-choice test of language arts knowledge which focuses on the nine curriculum topics covered during the experiment. The test contains items which are analogous to, but not identical with, those in both the TGT and RHES materials. A total score (reflecting an individual's responses across all nine topics) was calculated for each student at both pre-test and post-test times.

Self-Concept: The self-concept of the student has recently become a more prominent variable (both as moderator and outcome) in evaluating classroom interventions (see Shavelson, et al., 1976; Scheirer & Kraut, 1979 for recent reviews). The impact of individualized instruction on the student's academic self-concept is likely to be particularly positive, given the emphasis in the approach upon creating a series of learning opportunities which, while they challenge the student, should not overwhelm him or her.

To test self-concept, two scales were adapted from Coopersmith's Self-Esteem Inventory--Form B (Coopersmith, 1967). Both an eight-item General Academic Self-Concept Scale (example item: I am proud of my work in this class.) and a seven-item Social (Peers) Self-Concept Scale (example item: Most kids in this class are better liked than me.) were formed. The students were asked to respond to each item by checking either "Like Me" or "Unlike Me." The coefficient alphas (estimate of internal consistency) were .56 for the General scale and .56 for the Peers scale. While the coefficients are marginal they are close to those reported by others for Coopersmith's instrument (see Shavelson, et al., 1976), and probably reflect the relatively small number of items per scale, and a more general difficulty in measuring the construct.

Analytical Srategy

The linear multiple regression model proposed by Cohen (1968) and others was used as the principal analytical tool. This approach allows for handling of covariates and the direct computation of the power of any impact. The model tested for (1) treatment effect, (2) first order interaction effect, and (3) teacher effect, to give a fuller picture of the impact of the treatments relative to other forces. Because of the interdependencies created among students in the treatment groups, the classroom, not the students, was the unit of analysis. Classroom averages were used.

Complete Design

This manuscript, in the interest of comparing the two innovative instructional approaches, focuses on the 2 x 2 design. In fact, data were collected from a fifth treatment group--an external control group. The control group specifications focused only on the curriculum objectives for

the 10-week period. The teachers were allowed to use whatever instructional approach they typically used to teach those particular language arts skills. They were specifically asked not to use TGT or the Random House English Series. Comparisons between the experimental groups and the control group will be reported in a later paper.

RESULTS

Implementation

A question of particular relevance in a large-scale field test is whether the teachers actually implemented the treatment. To help answer this question, the authors distributed a blank teacher log book to all teachers. The log book was to be filled out weekly. The teachers were asked to define specifically what instructional materials were used and how. Without reporting the data in detail, the logs, combined with the observations of the consultant working in the classroom, suggest that in fact TGT and RHES were systematically applied by the 19 teachers.

Academic Achievement

As indicated earlier, classroom averages were used as the basic unit of analysis. The N in all analyses was 57 (19 teachers, 3 classes per teacher).

Insert Table 1 About Here

The results of the multiple regression are cited in Table 1. The table lists the Incremental R^2 (amount of variance explained above and beyond the sources already entered into the analysis), F-Ratio and degrees of freedom (df) for each of the six sources of variance included in the model.

In reviewing the effects noted in Table 1 by relative power, clearly pre-test explains the greatest variance (more so for the standardized

test--Hoyum-Sanders). Next in impact was the teacher effect, explaining 13% and 9% of the variance for the two achievement tests. The instructional approach term did differentiate for the treatment specific test, accounting for 11% of the variance. Figure 2 contains a description of the effect by use of mean scores. While learning is evidenced in both treatments, clearly the TGT classrooms evidenced greater growth in language arts skills. The TGT effect did not appear for the Hoyum-Sanders, with the Instructional approach term accounting for literally none of the variance. As Figure 3 indicates, both treatment groups increased their scores at roughly the same rate.

Insert Figures 2 And 3 About Here

Neither the teacher training mode main effect nor interaction effect proved significant for either achievement measure. The results suggest that more extensive training of teachers and ongoing consulting with them had little incremental effect on their students' performance.

Insert Table 2 About Here

Self-Concept

The impact of the treatments on the students' self-concept is outlined in Table 2. In contrast to the results for academic achievement in which the overall regression model as a whole predicted about 95% of the variance, self-concept variance is significantly less predictable (model accounts for about 50% of the variance). The teacher variable for self-concept appears as powerful as the individual difference variable (pre-test score on the self-concept instrument). Both variables account for roughly 20% of the variance. The nonsignificant F-ratios for both tests represent an anomaly, not easily explained. Of the two variables of principle

interest in the study--instructional approach and teacher training--only the former directly impacts self-concept. The instructional approach accounts for 6% of the variance of Self-Concept regarding Peers scale. This impact is significant ($F = 4.24$, $df = 1,51$, $p < .05$). Figure 4 contains the appropriate mean scores, suggesting that TGT has a positive impact on this socially oriented aspect of self-concept.

Insert Figure 4 About Here

A significant instructional mode by teacher training interaction effect was detected for the general self-concept scale. That interaction is detailed in Figure 5. It appears that of the two interventions, TGT has the greater possibility of either increasing or decreasing a student's general academic self-concept. Examining the classroom mean scores for the TGT treatment in which a decrement in self-concept scores was noted, suggests that teachers act as strong moderators of this impact. The decrement in general self-concept is typically limited to classes from three of the five teachers in that treatment group. Interestingly enough, Table 2 suggests that academic ability (focused on language arts) does not predict either social self-concept or a more general academic self-concept for the students.

Summary

The analyses indicate a modest differential effect of TGT (vs individualized instruction) on both academic achievement and self-concept. TGT was found to increase scores (above that created by RHES) on a treatment-specific achievement test. The result did not hold up for a standardized measure. TGT also had a greater impact on one of the two self-concept scales (namely, relations with peers). Intensity of teacher training

had no significant direct effect on either achievement or self-concept. The teacher effect was particularly great for academic achievement.

DISCUSSION

After conducting such a large-scale experiment, it's always important to assess the significance of the results. How do these results fit into existing literature? What theoretical issues were, if not resolved, at least raised? What implications are there for classroom instruction?

Issue--Small Group vs. Individulized Instruction: The results provide limited support for the notion that small group instruction is as effective, if not more so, than a structured individualized approach to teaching basic cognitive skills. The result supports the other TGT studies in which students in TGT conditions evidenced more learning in such subject areas than students in more "traditionally" conducted classrooms (see DeVries & Slavin, 1978). The current study suggests that TGT, an intervention focusing on larger classroom management issues (such as who gets rewarded, in what medium?), can have as direct an effect on the learning process as an individualized instructional approach which focuses much more directly on defining in highly specific terms the learning process for each student. While TGT, and other small-group interventions, focus on creating alternative environments which facilitate classroom interpersonal processes, the intervention also appears to facilitate the cognitive processes required for increased learning by the student.

The lack of differences between TGT and the individualized instructional approach on the standardized achievement measure can be interpreted in at least two ways. It can reflect the weakness of the TGT effect, suggesting the relative impact does not generalize across a wider range of language arts skills. It might also be due to the inflexibility of scores on

the Hoyum-Sanders. As Table 1 indicated, 87% of the variance in the post-test score was accounted for by the pre-test score. It is possible that the Hoyum-Sanders is a measure of basic language arts ability and would prove unresponsive to any classroom intervention.

The positive impact of TGT (relative to individualized instruction) on a child's self-concept in the social domain should be interpreted in the context of the growing body of small-group literature. As noted by Slavin (1977), Johnson & Johnson (1971), and others, small-group interventions such as TGT create (almost by definition) a supportive social network for each student. The research in TGT (DeVries & Slavin, 1978) also suggests students in TGT classrooms help each other more, get more support from peers for doing well, and experience less social isolation. It is only natural that such changes in the interpersonal environment would create a more positive self-concept. Since the primary focus of individualized instruction is on isolating (in a curriculum sense) each student, the observed result is to be expected.

Issue--Level of Teacher Training: A particularly surprising result is the lack of any impact of a more intensive teacher training (using workshop and ongoing consulting) on achievement or self-concept. Several explanations offer themselves. Perhaps the demand characteristics of being in a pilot program, one with some visibility in the school, "encouraged" all teachers to become highly involved in the new instructional approach. Only one teacher dropped out of the program during the ten-week period, and this was due to reasons other than lack of interest. Another possibility is that the more intensive training model created a dependence on the "expert," whereas the teachers who only had the manual were forced to take responsibility for the fate of the experiment in their classes. Or finally,

the workshops and/or consulting may have been ineffective. Evaluations by teachers of both the workshops and consulting visits would not support this interpretation, however.

From other experiences in TGT adoption training, the authors would suggest the particular value of the workshop-introduction process is to promote commitment to the proposed teaching strategy. This commitment was already present in these teachers by virtue of their willingness to participate in the study. In fact, it is our judgment that the "willingness to participate" factor provided a group of teachers who were able to implement either strategy, TGT or RHES.

Issue--Teacher Effect: The results support earlier TGT research (DeVries & Slavin, 1976) and larger educational research regarding the powerful impact of teachers, an impact equal to if not greater than that of the particular instructional approach used. The large amount of variance accounted for by teacher in student self-concept in particular deserves further attention. The results support those of Pedersen, et al., (1978) who recently documented some profound and long-term impacts of a teacher on students' self-concept and later adult status. What obviously needs further research is the issue of what, behaviorally, teachers do to create this impact, particularly on self-concept.

Issue--Large Scale Field Tests: After conducting an experiment of this magnitude, the authors certainly, if not the larger educational community, should examine the merits of such a strategy. Did the findings warrant such a major expenditure of time? The value of such experimentation appears to be testing out classroom interventions using a "worst-case scenario." Clearly, given the number of teachers involved and the lack of visibility of the experimenters, the treatment is not subjected to many of the "demand

characteristics" prevalent in laboratory settings. The study approximated those conditions prevalent in wide-scale curriculum adoption. While such field experimentation may be creating a worst-case scenario, it's the kind of scenario important to create in evaluating the efficacy of any proposed classroom intervention.

References

Atkinson, R. C. Computer-based instruction in initial reading. In Proceedings of the 1967 Invitational Conference on Testing Problems. Princeton, N.J.: Educational Testing Service, 1968.

Block, J. H. (Ed.). Mastery learning: Theory and practice. New York: Holt, Rinehart and Winston, 1971.

Buros, O. K. (Ed.). The seventh mental measurements yearbook (Vol. 1). Highland Park, N.J.: Gryphon Press, 1972.

Coopersmith, S. The antecedents of self-esteem. San Francisco: Freeman, 1967.

DeVries, D. L., & Slavin, R. E. Teams-Games-Tournament: A final report on the research (Rep. No. 217). Baltimore: The Johns Hopkins University, Center for Social Organization of Schools, August 1976.

DeVries, D. L., & Slavin, R. E. Teams-Games-Tournament (TGT): Review of ten classroom experiments. Journal of Research and Development in Education, 1978, 12, 28-38.

Glaser, R. Adapting the elementary school curriculum to individual performance. In Proceedings of the 1967 Invitational Conference on Testing Problems. Princeton, N.J.: Educational Testing Service, 1968.

Johnson, D. W., & Johnson, R. J. Instructional goal structure: Cooperative, competitive, or individualistic. Review of Educational Research, 1974, 44, 213-240.

Michaels, J. W. Classroom reward structures and academic performance. Review of Educational Research, 1977, 47, 87-98.

Myers, J. L. Fundamentals of experimental design. Boston: Allyn and Bacon, 1966.

Pedersen, E., Faucher, T. A., & Eaton, W. W. A new perspective on the effects of first-grade teachers on children's subsequent adult status. Harvard Educational Review, 1978, 48, 1-31.

Scheirer, M. A., & Kraut, R. E. Increasing educational achievement via self concept change. Review of Educational Research, 1979, 49, 131-150.

Shavelson, R. J., Hubner, J. J., & Stanton, G. C. Self-Concept: Validation of construct interpretation. Review of Educational Research, 1976, 46, 407-441.

Slavin, R. E. Classroom reward structure: An analytical and practical review. Review of Educational Research, 1977, 47, 633-650.

Slavin, R. E. Using student team learning (The Johns Hopkins Team Learning Project). Baltimore: The Johns Hopkins University, Center for Social Organization of Schools, 1978.

Figure 1

Treatment Groups Created in Field Study

Teacher Training Approach	Instructional Approach: TGT	Instructional Approach: Individualized Instruction
Workshop/ Consult	Teachers: 5 Classes: 15 Class Size: 17 to 31 Treatment I	Teachers: 4 Classes: 12 Class Size: 11 to 28 Treatment II
Written Materials	Teachers: 5 Classes: 15 Class Size: 10 to 32 Treatment III	Teachers: 5 Classes: 15 Class Size: 13 to 28 Treatment IV

Figure 2

Classroom Means for Treatment Effect on Achievement

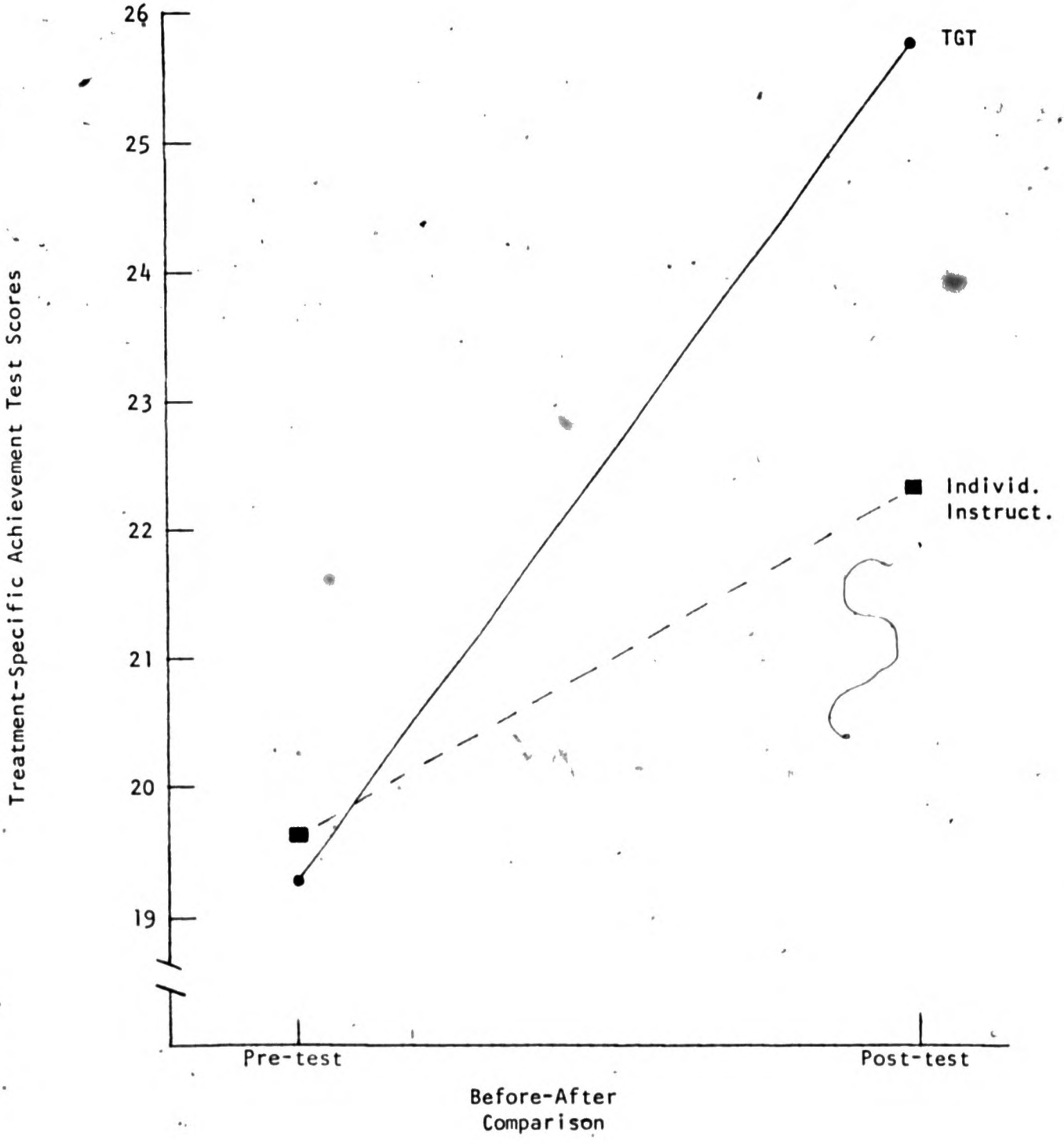

Figure 3

Classroom Means Examining Treatment Effect--Hoyum-Sanders

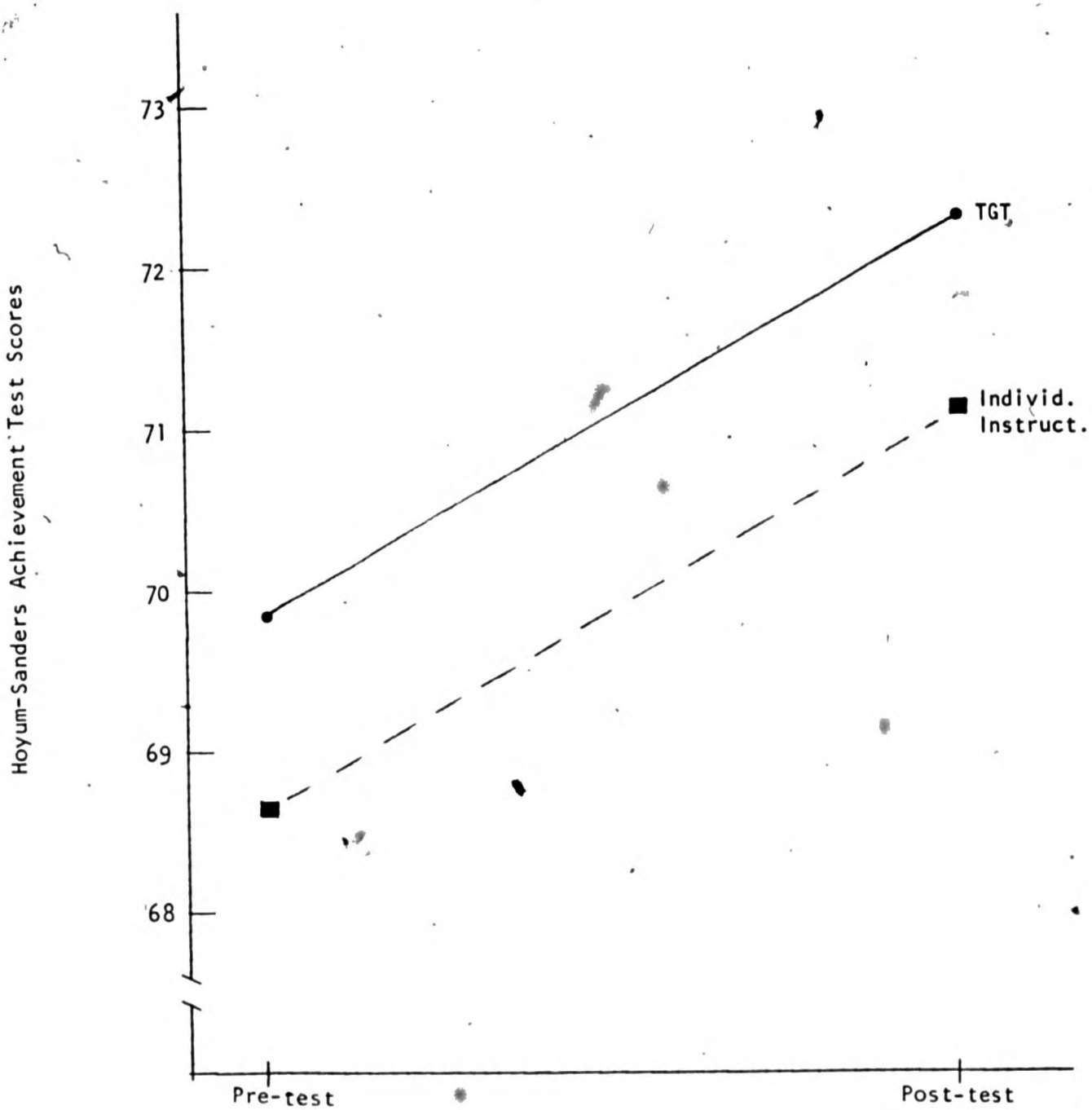

Figure 4

Classroom Means Depicting Treatment Effect On
Self-Concept Regarding Peer Relationships

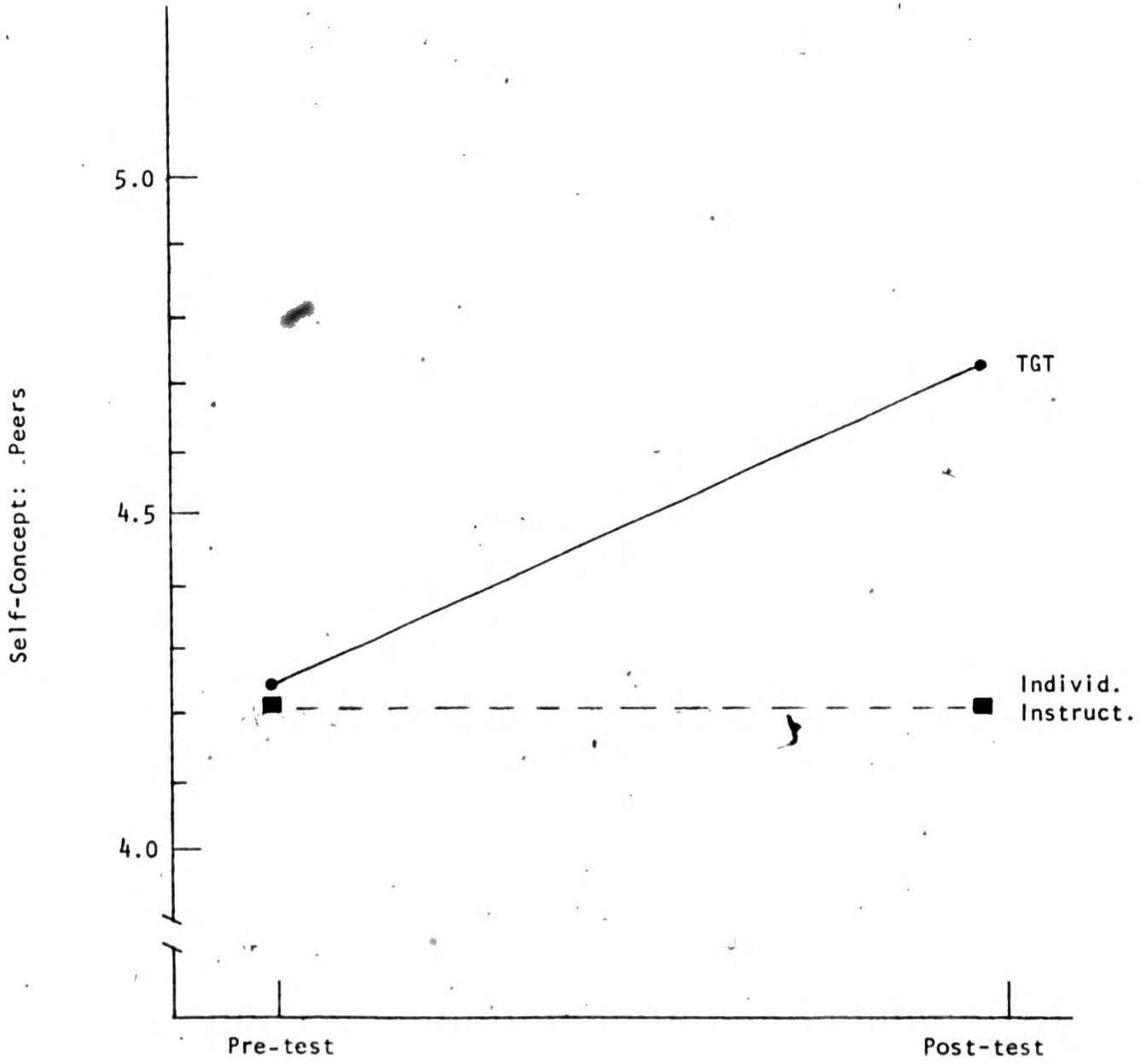

Figure 5

Classroom Means Depicting Interaction
Effect for Self-Concept - General

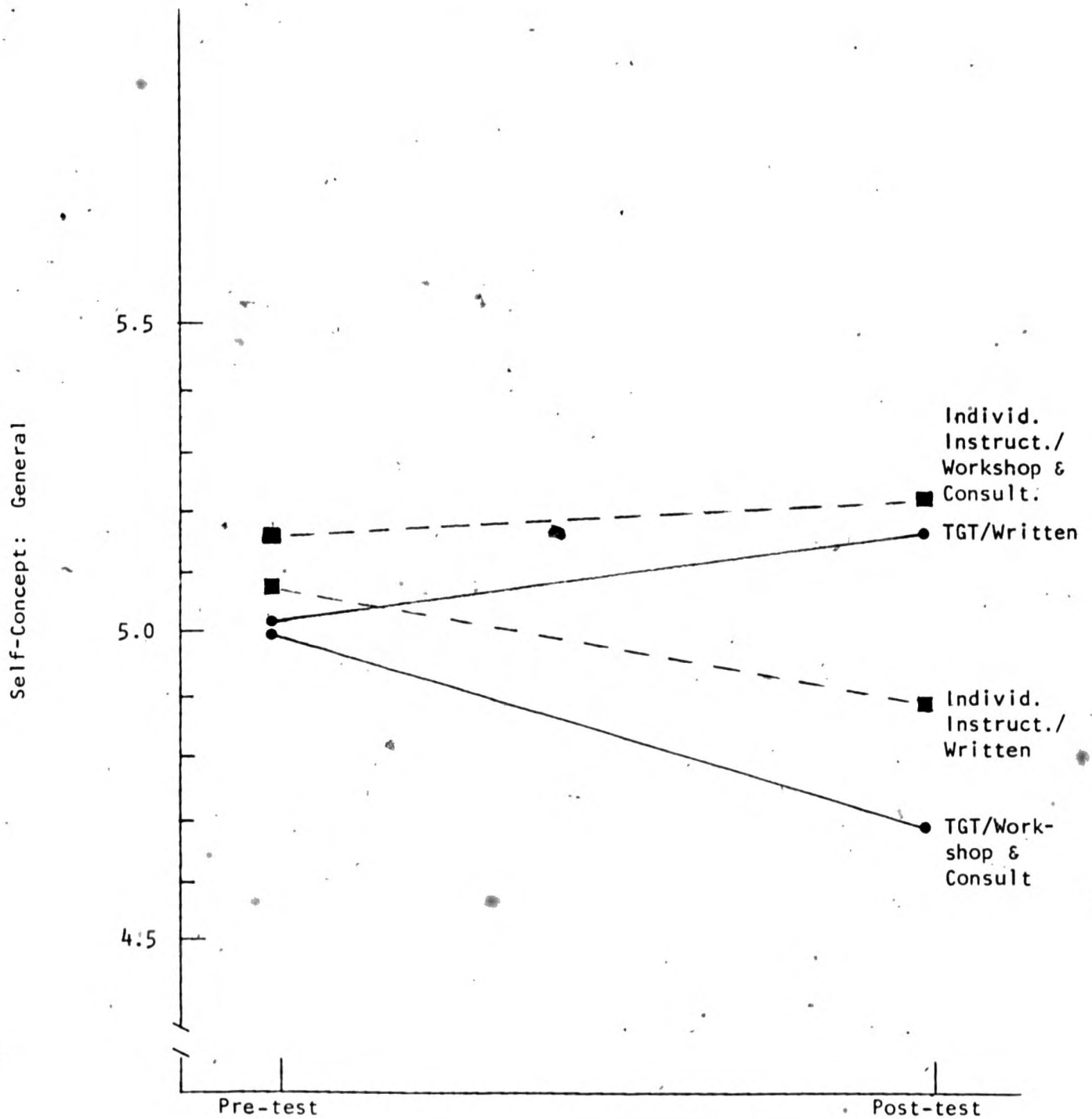

Table 1

Academic Achievement:
Results of Multiple Regression Analyses

	Variable				
	Treatment Specific		Standardized: Hoyum-Sanders		
Source	Incremental R^2	F	Incremental R^2	F	df
Ability (Pre-test)	.71	134.15*	.87	362.08*	1, 55
Instructional Approach (A)	.11	16.14*	.00	< 1	1, 18
Teacher Training Mode (B)	.00	< 1	.01	1.05	1, 18
A x B	.00	< 1	.00	< 1	1, 18
Teacher	.13	5.22*	.09	4.30*	18, 34
Error	.05		.04		

*p < .01

Note: The unit of analysis is classroom (averages), not student. The N = 57 classrooms.

Table 2

Self-Concept:
Results of Multiple Regression Anaylses[1]

Source	Variable: Self-Concept: Peers Incremental R^2	F	Self-Concept: General Incremental R^2	F	df
Ability (Hoyum-Sanders Pre-test)	.02	<1	.01	<1	1, 55
Pre-test (Self-concept)	.19	16.81**	.21	16.07**	1, 51
Instructional Approach (A)	.06	4.24*	.00	< 1	1, 51
Teacher Training Mode (B)	.00	<1	.01	<1	1, 51
A x B	.02	1.44	.09	6.30**	1, 51
Teacher	.20	<1	.25	1.05	18,33
Error	.51		.44		

*p < .05
**p < .01

Note: N = 57 classrooms

[1]Based on the nonsignificance of the Teacher variable, a pooled estimate of error variance (Teacher plus error) was used as the denominator in calculating F ratios for the other effects in the model (see Myers, 1966).