DOCUMENT RESUME

ED 295 364 EC 202 600

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TITLE Middle School Study of Mainstreamed Students Dissemination Report: A Summary of Year One Findings and Year Two Research Activities.
INSTITUTION Houston Univ., Tex. Coll. of Education.
SPONS AGENCY Special Education Programs (ED/OSERS), Washington, DC.
PUB DATE 88
NOTE 18p.
PUB TYPE Reports - Evaluative/Feasibility (142)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Academic Achievement; *Classroom Communication; Classroom Techniques; *Disabilities; Educational Practices; Inservice Teacher Education; Interaction; Intermediate Grades; Intervention; Junior High Schools; Low Achievement; *Mainstreaming; *Middle Schools; Special Education; Teacher Behavior; *Teacher Effectiveness; *Teacher Student Relationship; Teaching Methods; Teaching Styles; Time on Task

ABSTRACT

The Middle School Study of Mainstreamed Students sought to establish a foundation for interdisciplinary research on middle school mainstreaming by merging teacher effectiveness and special education practices. The study examined teaching behaviors through macro (classroom) and micro (individual student) analyses of classroom interactions, to identify those interactions which produce high levels of teacher and learner performance. An experimental group of middle school social studies teachers participated in an inservice program on effective use of classroom time, consistency management, and interventions for low-achieving and mainstreamed students. Results of the first year's research indicated that teachers known to be effective at the macro level were also found to be effective, high-impact teachers at the micro level. In the second year, the sample pool and research design were modified, and initial analyses of second year data support the first year findings. (JDD)

MIDDLE SCHOOL STUDY OF MAINSTREAMED STUDENTS DISSEMINATION REPORT: A SUMMARY OF YEAR ONE FINDINGS AND YEAR TWO RESEARCH ACTIVITIES

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May, 1988

This project is supported by a grant from the Office of Special Education Programs, U.S. Department of Education. The authors wish to thank Tracy Lilly for her care and assistance in preparation of the manuscript.

Middle School Study of Mainstreamed Students Dissemination Report: A Summary of Year One Findings and Year Two Research Activities

The most prevalent approach of regular education researchers who study classroom instruction has been the process-product paradigm. This research has identified generic teaching behaviors that are linked to gains in student achievement or attitudes. In special education, the work on teacher planning, questioning tactics, contingency control, direct instruction, and teacher praise are examples of variables that have been manipulated to influence learner outcomes. Only recently have special educators replicated the traditions of teaching effectiveness researchers. Specifically, work by Reith, Wang, Semmel, Larrivee and others now links effective teaching findings with special populations.

Much of the teacher effectiveness research, however, has been grounded in the elementary grades. Middle school teaching effectiveness has been characterized by a dearth of research. Variously configured in the United States to include grades 4-8, 5-8, and 6-8, middle schools have dipped into the traditional elementary school organization to establish a bridge between elementary and senior high schools. The recent emphasis on content specialization has spawned the middle school organization which is rapidly becoming the predominate organizational link between early and later grades replacing the traditional junior high school. Because of the rapid growth of middle

schools and its important linking role, this study has focused on students who are mainstreamed into middle schools.

The Middle School Study of Mainstreamed Students, therefore, was designed to merge teacher effectiveness and special education practices to establish a foundation for interdisciplinary research on mainstreaming. The effort is directed at identifying teaching behaviors through macro (classroom) and micro (individual student) analyses of classroom interactions which produce high levels of teacher and learner performance. The studies described here identify those teaching behaviors which are alterable in order to improve educational outcomes for mainstreamed students.

Research Methods

Subjects

Subjects are middle school teacher volunteers from the metropolitan Houston area. Selection criteria includes (a) currently teaching 6th, 7th, or 8th grade social studies, and (b) enrollment of at least one, but preferably two, mainstreamed students in the class.

Observation Procedures

Observations are conducted at three points-in-time: October, Feb.. .; , and April. Each teacher is observed for three consecutive days during these observation periods. Thus, teachers are observed for a total of 9 times each. Two observation instruments are used to collect data. The Stallings Observation Instrument (SOI) (Stallings & Needels, 1985) is employed to gather macro (whole class) data. Micro

(individual student) observations are collected using a coding system adapted from the SOI (see Brady, Swank, Taylor, & Freiberg, in press).

Macro (SOI) Observations. The SOI is a direct observation coding system to assess interactions between a teacher and the classroom as a whole. Results derive from two independent observations, the snapshot and the five-minute interaction.

The snapshot is a one-minute observation that provides an overall picture of the classroom, indicating the activity in which the teacher is involved, the materials being used, with whom the teacher is working, and the activities of the students not working with the teacher. Snapshots are completed five times per class period.

The five-minute interaction documents the interactions between teachers and students during five 5-minute segments, dispersed over the total class period. Interactions are coded into "interaction frames" of four components -- who, to whom, what, and how. Approximately 300 frames are recorded per class.

Micro (Individual) Observations. The focus of the micro observation code is on interactions between individual students (two mainstreamed and four regular education students) and the teacher. Behavior categories are coded as either interactive or noninteractive, and as academic and nonacademic. Thus, there are coding categories for interactive academic, interactive nonacademic, noninteractive academic, and noninteractive nonacademic behaviors. Definitions for each of these categories are provided in Brady et al. (in press).

Experimental Intervention

During the intervention, members of the experimental group receive a 15 hr. inservice over the course of 6 weeks. The content of the intervention is partially based on materials by Stallings (1985), Consistency Management materials by Freiberg (1983), and interventions for low achieving and mainstreamed students (Brady, 1987). Procedural elements common to all presentations are (a) opening activity and agenda, (b) review of activities previously completed, (c) introduction of new topics and their relationship to previous activities, (d) participant discussions and idea exchange, (e) participants' commitments to try new techniques, and (f) workshop summary and evaluation. Using this framework, each presentation has a specific focus: Week one -- review of pre-intervention observations, what research says about using classroom time effectively; Week two -- self-analysis of teaching effectiveness, effective classroom management, cooperative learning activities; Week three -- interacting with mainstreamed and low-ability students, planning and matching instruction to students, delivering cues and consequences; Week four -- audiotape analysis and peer observation to self-evaluate teaching effectiveness, seating chart analysis to identify off-task students; Week five -- increasing classroom interactions, questioning techniques to increase higher level thinking; and Week six -- effective use of reading aloud activities.

Year One Research Results

In our first year we investigated a number of research questions that yielded various reports of our findings.

Individual Students (Micro) Effects

In this study, we were interested in determining if the teacher inservice would produce micro (teacher to individual student) interaction differences in the experimental group, if those differences were moderated by classroom type (heterogeneous or homogeneous) and student type (mainstreamed student or regular education student), and if differences would persist over time (Brady, Swank, Taylor, & Freiberg, in press). Our analysis method was a doubly multivariate statistical technique, with condition (experimental vs. control) and classroom type as the between-subjects factors.

Results (see Table 1) were significant at the multivariate level for condition, classroom type, student type, condition by classroom type, and classroom by student type. As important we found that these results persisted over time. These findings demonstrated substantial changes in teacher interaction patterns with both mainstreamed and regular education children. Further changes were seen in student behavior when teachers and students were not interacting. These noninteractive changes were particularly related to classroom type, and the results have been discussed further in a paper addressing grouping effects solely. Research presented in the "micro effects" paper is currently in press in the Journal of Educational Research.

Grouping Effects

In our grouping effects analysis we followed up the placement results found in our "micro" study. When compared to homogeneous (low ability) grouping, this study showed that heterogeneous placement

is more closely associated with effective teaching. However, there are desirable and less desirable outcomes associated with both placement practices. These results are summarized in Tables 2 and 3 (Swank,

Table 1: Micro Effects

Multivariate analysis of variance for the pre-post and follow-up contrasts plus the between subjects effects.

	Contrast					
	Pre-post		Follow-Up		Between Subjects	
Source of Variation	Wilk's Lambda	F	Wilk's Lambda	F	Wilk's Lambda	F
Condition (Exp. vs Cond.)	.85	2.09*	.87	1.84*	.75	3.89*
Class Type (Homog. vs Hetero.)	.87	1.74*	.90	1.34	.71	4.80*
Student Type (MS vs. Non-MS)	.92	1.09	.92	1.07	.77	3.57*
Condition X Class	.83	2.52*	.88	1.58	.81	2.81*
Condition X Student	.92	1.01	.86	2.00*	.89	1.42
Class X Student	.95	.66	.91	1.18	.83	2.47*
Condition X Class X Student	.92	1.07	.90	1.31	.90	1.32

* ($p<.05$)
Note: All degrees of freedom equal to 18 and 214.

Table 2: Grouping Effects

Outcomes associated with heterogeneous ability grouping in mainstreamed middle school classrooms

Heterogeneous Groups	
Desired* Outcomes	Less Desired* Outcomes
When not interacting with the teacher, students spend	When interacting with students, teachers spend
a. more time on-task	a. less time providing academic guidance
b. more time involved with task-appropriate objects and materials	b. less time providing academic information
c. less time involved in conduct related activities	c. less time providing both academic and nonacademic reinforcement
When interacting with students, teachers spend	
a. less time providing nonacademic guides	
b. less time giving non-academic corrections	

*See Table 3

Taylor, Brady, Cooley, & Freiberg, in press). This paper is currently in press in NASSP Bulletin.

Whole Classroom (Macro) Effects

In this study, we were interested in determining if the intervention would produce macro (teacher to student group) interaction differences in the experimental group, if those differences were

Table 3: Grouping Effects

Outcomes associated with homogeneous ability grouping in mainstreamed middle school classrooms

Homogeneous Groups	
Desired* Outcomes	Less Desired* Outcomes
When interacting with students, teachers spend a. more time giving academic information b. more time providing academic guidance c. more time delivering both academic and non-academic information These outcomes accrue especially for mainstreamed students	When interacting with students, teachers spend a. more time proving nonacademic guides b. more time giving nonacademic corrections When not interacting with the the teacher, students spend a. more time off-task b. less time using task-appropriate objects and materials c. more time involved in conduct related activities These outcomes accrue especially for mainstreamed students

*Narrative descriptions of group means on the basis of multivariate ($p<.05$) and univariate ($p<.003$) differences found across 18 variables measured in 40 middle school classrooms on three occasions.

moderated by classroom type (heterogeneous vs. homogeneous), and if any differences found would last over time. Again, the analysis was a doubly multivariate statistical technique.

Our results were directional, but did not reach nominal significance levels ($p<.05$) at the multivariate level. On the other hand, four of the seven SOI variables did reach significance level at the univariate level. Therefore, we have explored these findings with the appropriate caution that the probability of type 1 error may be inflated. Overall, we found that (a) experimental teachers spent more time involved in interactive instruction than did control teachers; (b) experimental teachers spent less time than control teachers in classroom management activities; (c) experimental teachers had to make fewer behavioral control statements than did controls; and (d) students were off-task less in experimental classrooms. We further found that these differences persisted over time. These results (Freiberg, Brady, Swank, & Taylor, 1988) were presented recently in a paper delivered at the 1988 AERA conference.

Synthesizing Measures of Effective Teaching

In this examination we were interested in determining the relationship between macro and micro measures of teaching effectiveness. To address this issue, we used a sorting and recoding technique to identify most and least effective teachers using Stallings (macro) criteria. Macro criteria were used as the code of comparison since each of the 37 Stallings' variables has a target criterion that serves as an indicator of effectiveness. The two groups were then contrasted using micro measures. Multivariate and univariate results were significant, supporting the contention that

Table 4

Teacher Characteristics related by macro-micro measures.

At the macro level these teachers were shown to:	At the micro level these teachers were known to:
1. Interact with groups of students in a manner that allows the teacher to spend less time organizing to teach and more time teaching.	1. Engage individual students in academic questioning interactions at a rate more than twice that of ineffective teachers.
2. Interact with groups of students in a manner that results in the teacher spending less time involved in classroom management and in off-task behaviors, and spending more time teaching.	2. Deliver almost double the amount of Academic reinforcement to individual students than do ineffective teachers.
3. Interact with groups of students in a way which produces less independent student work, less student involvement in classroom management activities; and less student time off-task. Instead, students spend more time involved in interactive instruction with the teacher.	3. Maintain classrooms where more individual students are academically on task, less involved in peer interaction and less likely to use academic objects and materials.
4. Spend more time delivering academic statements, and less time delivering organizational, behavioral, and social statements.	4. Manage classrooms where conduct problems involving individual students occur at about one-sixth the rate found in classrooms of ineffective teachers.

* Narrative descriptions of group means on the basis of multivariate ($p = .000$) and univariate ($p < .003$) differences.

teachers effective at the macro level are also effective at the micro

lev ' onally, teachers known to be effective at the group (macro)

lev found to be high impact teachers at the student (micro)

level. Initial findings are summarized in Table 4, and were reported at the 1988 AERA conference (see Freiberg, et al., 1988).

In a subsequent analysis, we extended our efforts toward synthesizing macro and micro measures by approaching the question using different statistical techniques (Swank, Taylor, Brady, & Freiberg, 1988). This second analysis demonstrated that the type of analytic technique used can influence the sensitivity of classroom and teacher observation systems. These results are particularly important as classroom observation systems gain increased attention as potential tools in school accountability schemes.

Observational Reliability

During each of our studies, reliability in our training and field observations was maintained at 80% or greater. Agreement was the reliability index which we employed for this purpose. However, there are more substantial and technically detailed issues relating to observational reliability. In this analysis, we approach those issues, including generalizability theory, using different statistical techniques and rationales (Swank, Novy, Taylor, Brady, & Freiberg, 1988).

Year Two Research Activities

We have made modifications to the sample pool and design for the second year of the project. We expanded the sample of teachers to include:

1. 16 sixth-, seventh-, and eighth-grade science teachers;
2. 16 sixth-, seventh-, and eighth-grade social studies teachers selected from a new district; and

3. 16 sixth-, seventh-, and eighth-grade social studies teachers randomly selected from the Year One group of 44 social studies teachers. The total sample of teachers in the study remains at 40 with 8 alternates.
4. Two additional districts have been added.

These modifications respond to changing conditions of the school environments in which the mainstreaming study is being conducted. The modifications strengthened the study and provided for a greater ability to generalize the results to other districts which are operating under similar conditions.

Based upon our modifications for Year II, our research questions are:

- Will gains made by social studies teachers during Year 1 be maintained during Year II with only minimal training?
- Will a new group of social studies teachers who receive the intervention show changes equal to that of the teachers studies in Year 1?
- Will the effects of the intervention improve interaction patterns between science teachers and their students?

We continue to monitor participating classrooms at both the macro-interaction (classroom-wide) level and the micro-interaction (individual students) level. Also, we continue to employ the heterogeneity of the classroom as a potential moderator variable, to see if the effects are the same for homogeneous classrooms as for heterogeneous ones.

Figure 1

Year II: Macro-design

Classroom Type	Maintenance				Group Replicate				Generalization			
	exp.		ctl.		exp.		ctl.		exp.		ctl.	
homo.	M1 M2 M3		M1 M2 M3		M1 M2 M3		M1 M2 M3		M1 M2 M3		M1 M2 M3	
hetero.	M1 M2 M3		M1 M2 M3		M1 M2 M3		M1 M2 M3		M1 M2 M3		M1 M2 M3	

The resulting design for the macro-interaction study is shown in Figure 1. It can really be thought of as three separate factorial designs, one for each of the major research questions. The Figure 1 "maintenance" group refers to question 1, the "replicate" group refers to question 2, and the "generalization" group refers to question 3. For each group, the variables include presence or absence of the experimental treatment, classroom type (homogeneous vs. heterogeneous), and time of observation [pre (MI), post (M2), and follow-up (M3)], this latter variable being a repeated measure. Observations took place during October (M1), February (M2), and April (M3).

For the micro-design, seen in Figure 2, an additional variable, student type, has been included. Both mainstreamed and regular education students are observed on an individual basis within each selected classroom. For additional post hoc analyses, regular education students from heterogeneous classrooms are classified as low ability or as average to high ability by the teacher. The micro-observations take

Figure 2

Year II: Micro-desi

Groups* / Student Type	Experimental (N=8)				Control (N=8)			
	Mainstream			Regular	Mainstream			Regular
Homo-geneous	Pre	Post	Follow-up	Pre Post Follow-up	Pre	Post	Follow-up	Pre Post Follow-up
Hetero-geneous	Pre	Post	Follow-up	Pre Post Follow-up	Pre	Post	Follow-up	Pre Post Follow-up

*Groups = Maintenance (N=16); Replicate (N=16); and Generalization (N=16)

place at the same point during the semester as the macro-observations. This design is also factorial, with the intervention as the experimental condition, classroom type as a moderator variable, student type as an additional moderator variable, and time of observation as the repeated measures factor.

Initial analyses of the Year Two data support our first year findings. These data will continue to be reported as final analyses are completed.

More information on The Middle School Study of Mainstreamed Students can be obtained by contacting the investigators at:

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