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ABSTRACT

A study examined student initiated and teacher initiated influence patterns that make up aspects of bidirectionality. The study also identified ways in which these patterns relate to student learning and attitudes. Study subjects included 21 fifth-grade students and their teacher. Thirty-six social studies lessons, representing a unit, were videotaped over a 10 week period. Classroom interaction was assessed with an adaptation of the Teacher-Child Dyadic Interaction instrument. Learning was assessed with 30-question multiple choice tests administered during and following the study, and attitudes toward the teacher and lessons were assessed with "Pupil Perceptions of a Class Period" and "Postclass Reactions," each of which were administered 9 times during the study. Overall study findings provide support for a bidirectional model of classroom interaction, in which both the teacher and students exert influences on one another. The most significant finding seems to be that student influence patterns are more closely related to higher levels of achievement and positive student attitudes. (JMK)

Student and Teacher Bidirectional Classroom Behavior: Effects on Classroom Interaction, Achievement, and Attitude

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Recent research explores a bidirectional model of teacher-to-student and student-to-teacher interaction. Results of several studies (Fiedler, 1975; Klein, 1971; Noble and Nolan, 1976; Sherman and Cormier, 1974) indeed confirm that students affect the behavior of teachers. These studies investigated the extent to which various student behaviors modify and control classroom events. Research done by Fiedler (1975) suggested that 7th grade students exert influence over classroom events and that they accurately perceive how much control they have. Klein (1971) demonstrated with college students that certain verbal behaviors of guest lecturers could be changed by attentive and nonattentive student behaviors. High school seniors were observed by Noble and Nolan (1976) and found to control whether or not they received a direct teacher question and the frequency with which the teacher addressed them.

Emmer and Evertson (1981), in a synthesis of the research on classroom management, suggest that a unidirectional research model of influence from teacher-to-student is overly simple. They conclude that very little is presently known about the effects of student influences on instruction and classroom interaction. Emmer and Evertson (1981) observe that this a "budding line of inquiry" (p. 346) and call for research that will identify specific student behavior and the influence process as it affects teacher behavior.

Studies of classroom interaction have traditionally proceeded from the assumption that teacher behavior influences or determines student behavior. Evidence indicates that while this is certainly

the case and teacher behavior does systematically alter student behavior, this unidirectional model represents only part of the interaction taking place in the classroom (Fiedler, 1975; Noble and Nolan, 1976). Student behavior demonstrated in response to teacher behavior, has recently been recognized as a powerful modifier and controller of teacher behavior as it results in specific changes in classroom events and instruction.

An integration of this research points to two major classroom influence patterns, which taken together comprise some aspects of bidirectional interaction. Brophy and Good's (1969) concepts of "child created" and "teacher afforded" interaction variables and Noble and Nolan's (1976) concepts of student and teacher behavioral contingencies offer a useful framework within which to define these two aspects of bidirectionality.

Purpose

The general purpose of the study was two fold; to examine two types of classroom influence patterns that comprise aspects of bi-directionality and to identify ways in which these patterns relate to student learning and attitudes. Influence patterns were defined as student initiated and teacher initiated. These two patterns were studied to determine their relationship to student learning and attitudes. Specifically, three questions were asked; the first two questions related to student-initiated and teacher-initiated influence patterns, and the third question to student-teacher influence patterns and student learning and attitudes.

Research Questions

1) What are the relationships between student answer quality; and teacher direct response opportunity and feedback? 2) What are the relationships between teacher direct response opportunity and feedback: and student open response opportunity, and student statements and questions, and answer length? 3) What are the relationships between student open response opportunity, questions and statements, answer length and quality; teacher direct response opportunity and feedback; and student learning (lesson tests, post tests, essay scores) and attitudes (toward lesson and teacher)?

Method

Subject

The study was conducted in a fifth grade classroom in a suburban middle school with 21 students (13 females, 8 males) and a female teacher who had taught for 10 years and had completed 60 graduate hours in education. Mean scores on the Iowa Tests of Basic Skills (Hieronymous & Lindquist, 1971) were vocabulary, $\bar{X}$=28.80, GE=6.1 and comprehension, $\bar{X}$=34.52, GE=6.4. Mean IQ score on the Lorge-Thorndike Intelligence Tests (Lorge, Thorndike, & Hagen, 1966), was $\bar{X}$=110.47. Scores suggest that the group was representative of typical fifth grade students.

Procedure

Thirty-six social studies lessons comprising a unit on "Industrialism," each of forty-five minute duration, were videotaped over a 10 week period. Classroom interaction was assessed with an

adaptation of the Teacher-Child Dyadic Interaction (TCDI)instrument (Brophy & Good, 1969). Student initiated and teacher initiated behaviors in this study conform to definitions outlined in the TCDI. Classroom interaction patterns were coded from the videotapes by two trained raters. Prior to data collection interrater reliability of at least .90 was achieved on all major subsections of the instrument. Learning was assessed with 30 question multiple choice tests during the study (lesson tests) and following the study (post tests and essays). Attitudes toward teacher and lessons were assessed with "Pupil Perceptions of a Class Period" and "Postclass Reactions" (Fox, Luszki, & Schmuck, 1966), each of which were administered nine times during the study.

Prior to each lesson the teacher gave a brief introduction to text material, involving background information and new vocabulary, before students read material silently. Teacher questions, group discussions, and activities such as word games, map reading, and occasional workbook pages correlating with text content followed silent reading. All lessons were videotaped with a stationary camera set up in one corner of the classroom. Prior to the onset of the study subjects were videotaped for three days during social studies classes and were able to view these videotapes to familiarize themselves with this practice (Adams & Biddle, 1970).

Pearson product-moment correlation coefficients were computed among student and teacher interaction variables and student learning/attitudes (Ferguson, 1981). Significant correlations ($p < .05$), are noted in Tables 1-4 and will be discussed relevant to the research questions.

Results & Discussion

In answer to question 1 (Table 1), there is a positive relationship between student answers that were both correct and incorrect and four aspects of terminal, as well as two aspects of sustaining feedback. Partially correct answers correlated positively with three aspects of terminal and two of sustaining feedback. No response correlated with direct response opportunities, two aspects of terminal and one of sustaining feedback. These findings indicate that students who respond to teacher questions, regardless of quality of response, elicit more of both types of teacher feedback, than students who do not participate by responding to questions. Looking at variations in quality of response (highest frequencies are for correct responses), there seems to be little overall difference in type of teacher feedback. Teacher feedback occurs in conjunction with all student response types. These correlations provide some evidence for one generalized pattern of student influence on teacher behavior.

Regarding question 2 (Table 2), there is a negative correlation between student open - and teacher direct - response opportunity indicating that student volunteering increased as the teacher directly selected fewer students to respond to questions. Six of seven aspects of terminal teacher feedback correlated positively with student open response opportunities, questions, and statements. This finding indicates that as the amount of terminal feedback increases student volunteering also increases, as does student answer length. Teacher

clues correlated with student volunteering, suggesting that as the teacher assisted students who were experiencing difficulty, students displayed increased volunteering. These correlations provide some evidence for one pattern of teacher influence on student behavior.

In partial answer to question 3 (Table 3), there was a positive correlation between student open response opportunity and attitude toward teacher and student learning on lesson and post tests. Student statements correlated positively, with lesson and post tests also. These findings indicate that student volunteering enhances how students view their teacher, or that those students who hold a positive view of the teacher voluntarily respond more often. Students who volunteer verbal statements in class apparently learn more and perform better, also. Student answer length correlates positively with attitude toward teacher and lesson and post tests, suggesting that students who verbally process information at greater length, view their teacher more favorably and learn more. Student correct responses correlate positively with attitude toward teacher, and lesson and post tests, indicating again a correspondence between verbal and written knowledge. Conversely, no response from students correlates negatively with essay and post test scores.

Remaining data to answer question 3 (Table 4), shows a negative correlation between teacher direct response opportunity and essay, lesson, and post test scores. This finding suggests that when the teacher called on students nonvoluntarily these students performed poorly on all learning measures. The two terminal feedback categories of affirm and process correlated positively with attitude

toward teacher and lesson and post tests. This finding corroborates widely held views about positive reinforcement and its effect on attitude and learning. The terminal feedback category of ask other correlate negatively with all three aspects of learning suggesting that students who are unable to answer questions, followed by question redirection to another student, perform poorly. One element of sustaining feedback, repeat, correlates negatively with attitude toward lesson, suggesting that students who are unsuccessful in answering questions hold negative views about the lessons.

Conclusion

Overall findings of this study provide support for a bidirectional model of classroom interaction, in which both the teacher and students exert influences on one another. As Emmer and Evertson (1981) suggest, a unidirectional model of influence from teacher to student is indeed incomplete and ignores the contribution of student behaviors to classroom interaction and the resulting effect on learning and attitude. The most significant finding of this study seems to be that student influence patterns are more closely related to higher levels of achievement and positive student attitudes. Underlying this finding appears to be the concept that optimum learning requires active participation and involvement by students during formal instruction, contrary to the practices of teacher dominated and passive learning Goodlad (1983) reports about today's schools.

Correlational support for bidirectionality does indeed exist and thus provides a rationale for designing experimental studies to

test the strength of student initiated influence patterns on learning and attitude. Evaluation studies might be designed to determine the extent to which teachers and students can be taught to support and use this and other models of student influence patterns. Teachers need to learn to identify and encourage greater amounts of student initiation and participation in formal instruction.

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Table 1

Relationships Between Student Answer Quality and;
Teacher Response Opportunity and Feedback

Student Behaviors	Teacher Behaviors										
		Terminal Feedback							Sustaining Feedback		
Answer Quality	Response Opportunity	DIRECT	AFFIRM	PRAISE	NONE	NEGATE	PROCESS	GIVES ANSWER	ASKS OTHER	REPEAT	CLUE	NEW QUESTION
CORRECT	-0.11791[a] 0.2630 92	0.94469 0.0001 125	0.18072 0.2294 46	0.41680 0.0004 68	0.34307 0.0009 91	0.75765 0.0001 111	0.24828 0.1224 40	-0.14241 0.1831 89	-0.14624 0.3744 39	0.45368 0.0001 96	0.34320 0.0012 86
INCORRECT	0.14410 0.2340 70	0.28636 0.0057 92	0.29254 0.0834 36	0.39069 0.0035 54	0.94045 0.0001 88	0.30732 0.0047 83	0.09934 0.5823 33	0.06613 0.5756 74	0.09120 0.5968 36	0.36573 0.0008 81	0.26080 0.0390 63
PARTIALLY CORRECT	0.03403 0.7378 65	0.58016 0.0001 90	0.18181 0.3113 33	0.15891 0.2560 53	0.12858 0.2924 69	0.30672 0.0060 79	0.04226 0.8154 33	0.23375 0.0481 72	0.23594 0.1724 35	0.49706 0.0001 78	0.28752 0.0183 67
NO RESPONSE	0.66943 0.0001 60	-0.04323 0.7204 71	0.38347 0.0643 24	-0.16184 0.3058 42	0.33957 0.0085 59	0.01729 0.8948 61	0.02453 0.9137 22	0.65935 0.0001 64	0.26517 0.1237 35	0.15109 0.2372 63	0.26292 0.0597 52

[a]Correlation Coefficients
Probability > (R) Under HO:RHO=0
Number of Observations

Table 2

Relationships Between Teacher Response Opportunity and Feedback;
and Student Response Opportunity, Statements, and Questions

Teacher Behaviors	Student Behaviors			
	Response Opportunity	Questions/Statements		Answer Length
	Open	Questions	Statements	Answer Length
RESPONSE OPPORTUNITY	-0.30685[a]	0.29216	-0.08993	-0.09006
DIRECT	0.0036	0.1659	0.6304	0.3933
	88	24	31	92
AFFIRM	0.82543	0.30881	0.29531	0.75717
	0.0001	0.0910	0.0545	0.0001
	121	31	43	125
PRAISE	0.11753	-0.09548	0.19029	0.28887
	0.4366	0.7563	0.3622	0.0515
	46	13	25	46
NONE	0.35034	0.29923	-0.10010	0.39532
	0.0037	0.2277	0.5921	0.0008
	67	18	31	68
NEGATE	0.40529	0.43340	0.01354	0.39264
	0.0001	0.0344	0.9357	0.0001
	90	24	38	91
PROCESS	0.70038	0.10005	0.56729	0.76670
	0.0001	0.6195	0.0001	0.0001
	110	27	43	111
GIVES ANSWER	0.12839	0.71881	-0.08317	0.23416
	0.4360	0.0001	0.7274	0.1459
	39	24	20	40
ASKS OTHER	-0.17645	0.19593	-0.02188	-0.10611
	0.1001	0.3822	0.9054	0.3223
	88	22	32	89
REPEAT	-0.01744	-0.02384	-0.30861	-0.10786
	0.9172	0.9445	0.2448	0.5134
	38	11	16	39
CLUE	0.37507	0.05991	-0.11872	0.38239
	0.0002	0.7760	0.4840	0.0001
	93	25	37	96
NEW QUESTION	0.03934	0.32097	-0.10355	0.14406
	0.7223	0.1453	0.5419	0.1857
	84	22	37	86

[a]Correlation Coefficients
Probability > (R) Under HO:RHO=0
Number of Observations

Table 3

Relationships Between Student Response Opportunity, Questions, Statements, Answer Length and Quality and; Student Learning and Attitudes

Student Attitude/Learning	Student Behaviors							
	Response Opportunity	Questions/Statements		Answer Length	Answer Quality			
	OPEN	QUESTIONS	STATEMENTS	ANSWER LENGTH	CORRECT	INCORRECT	PARTIALLY CORRECT	NO RESPONSE
ATTITUDE TOWARD LESSON	-0.01003[a] 0.9130 121	0.07171 0.7015 31	-0.19307 0.2148 43	-0.11056 0.2215 124	0.00464 0.9592 124	0.05005 0.6375 91	-0.13166 0.2161 90	-0.05811 0.6328 70
ATTITUDE TOWARD TEACHER	0.23900 0.0083 121	0.20765 0.2709 30	0.09478 0.5455 43	0.19334 0.0314 124	0.29343 0.0009 124	-0.03138 0.7678 91	0.20654 0.0521 89	-0.04102 0.7360 70
ESSAY SCORE	0.08944 0.3418 115	-0.06476 0.7293 31	-0.12656 0.4187 43	0.03599 0.6976 119	0.07383 0.4249 119	-0.13949 0.2002 86	-0.18695 0.0867 85	-0.27267 0.0245 68
LESSON TEST	0.38363 0.0001 121	-0.17945 0.3341 31	0.40964 0.0064 43	0.36421 0.0001 125	0.46360 0.0001 125	-0.19702 0.0598 92	0.14729 0.1659 90	-0.18907 0.1143 71
POSTTEST	0.38687 0.0001 121	-0.11801 0.5272 31	0.37441 0.0134 43	0.31353 0.0004 125	0.44023 0.0001 125	-0.12462 0.2366 92	0.13178 0.2157 90	-0.30776 0.0090 71

[a]Correlation Coefficients
Probability > (R) Under HO:RHO=0
Number of Observations

Table 4

Relationships Between Teacher Response Opportunity and Feedback and;
Student Learning and Attitude

Student Attitude/Learning	Teacher Behaviors										
	Response Opportunity	Terminal Feedback							Sustaining Feedback		
	DIRECT	AFFIRM	PRAISE	NONE	NEGATE	PROCESS	GIVES ANSWER	ASKS OTHER	REPEAT	CLUE	NEW QUESTION
ATTITUDE TOWARD LESSON	0.10295[a] 0.3315 91	-0.05799 0.5223 124	-0.18735 0.2125 46	0.23130 0.0577 68	-0.00401 0.9700 90	0.01611 0.8673 110	0.00093 0.9955 40	0.14926 0.1627 89	-0.32514 0.0434 39	0.04896 0.6375 95	0.14814 0.1760 85
ATTITUDE TOWARD TEACHER	-0.05535 0.6023 91	0.26765 0.0027 124	0.12337 0.4140 46	0.10661 0.3905 67	-0.04389 0.6796 91	0.25433 0.0071 111	0.17380 0.2835 40	-0.12460 0.2474 88	-0.07687 0.6465 38	0.10579 0.3076 95	0.11267 0.3046 85
ESSAY SCORE	-0.25655 0.0158 89	0.03574 0.6996 119	-0.22751 0.1423 43	0.06685 0.5997 64	-0.17073 0.1160 86	0.07858 0.4211 107	0.25071 0.1187 40	-0.23241 0.0334 84	-0.30090 0.0703 37	0.00600 0.9548 92	-0.08771 0.4276 84
LESSON TEST	-0.26441 0.0109 92	0.44796 0.0001 125	0.13275 0.3792 46	0.08800 0.4755 68	-0.14856 0.1599 91	0.33940 0.0003 111	-0.06774 0.6779 40	-0.34312 0.0010 89	-0.09528 0.5640 39	0.10142 0.3255 96	-0.02603 0.8119 86
POST TEST	-0.40026 0.0001 92	0.43195 0.0001 125	0.04291 0.7771 46	0.02982 0.8092 68	-0.09720 0.3594 91	0.34711 0.0002 111	0.06070 0.7099 40	-0.48736 0.0001 89	-0.27231 0.0935 39	0.07032 0.4960 96	-0.05329 0.6260 86

[a]Correlation Coefficients
Probability > (R) Under H0:RHO=0
Number of Observations