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Robert Dean Rogers
Azusa High School

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The School/Home Communication Project: A Study of the Effect of More Frequent Grade Reporting on the Achievement of High School Mathematics Students

*Robert Dean Rogers
Asuza High School
Asuza, CA*

INTRODUCTION

This study in empowering the family explored the impact of an increased flow of information on student achievement and productivity from the school to the family. The investigation into the effect of family management of student learning on the student's achievement was empirically grounded in an experiment that provided support for the managerial role of family by manipulating the periodicity and quantity of information on student progress that teachers sent to families. Findings support the general thesis that increases in both frequency and detail of individual student progress reporting to the family are positively related to student achievement.

The study was conducted in eight mathematics classes at a comprehensive high school in eastern Los Angeles County. Designated the School/Home Communication Project, the experiment was designed to inform those responsible for student learning, the families and students themselves, by transferring information collected as part of the teaching process from the classroom to the home quickly, frequently, and with as much of the detail available to the classroom teacher as possible. Parallel treatment and control classes for each participating teacher, identical as to content, were identified and selected. After a baseline data collection period ending at the first grade reporting of the fall semester, information usually available only to the teacher was sent each week to the families of students in treatment classes while students in control classes received only standard grade cards issued at six to seven week intervals called triads.

BACKGROUND

The investigation rested on a basic assumption that the family is responsible for the management of the student's learning. Confounding the acceptability of that role by the family are institutional practices, legal precedents, and societal norms which support a

traditional view of the classroom teacher as the manager of student learning.

The power of parents to influence their children has been the subject of inquiry for thousands of years. Eby and Arrowood (1940) noted that "The family in Athens controlled the education of the child, and family influence has always been recognized as an individualizing force" (p.197). In recognition of the importance of family support in positively affecting learning, schools have employed involvement strategies in an effort to control and manipulate that support. Family members have been asked to tutor, volunteer in the classroom, raise funds, serve on committees, select textbooks, and participate in the development of the curriculum. Myriad reasons have been given by families for not participating. Whether single, working, committed to a belief that the school has total responsibility for educating students, or disinterested, the lack of family involvement in the educational process has been vehemently noted by professional educators. Cleveland (1929) even went so far as to suggest that "The community was beginning to awaken to the need of training for parenthood" (p. 49).

This perennial argument over the amount of time a family must donate to the education of its children has produced an accusatory dialogue which has done little to remedy the failure of students to learn. Teachers accuse the family of shirking a responsibility. Families pursue legal strategies as redress for their perception that schools have failed to educate their children.

D'Evelyn in 1945 presented the popular view that "The home and school have joint responsibility for a child's development" (p.1). However, that conceptualization of school/home responsibilities has not been upheld by the courts. Schools have not been held accountable by the courts for failure of a student to learn. The home is ultimately responsible for the educational

outcomes of its child or children (Collis, 1990; Schimmel and Fischer, 1977).

The courts have distinguished between the school's responsibility to provide the facilities and means for learning and the student's responsibility and his or her family's responsibility to accept and use those facilities and means (Collis, 1990; Schimmel and Fischer, 1977). Failure of one student to learn has not been accepted by trial courts or appellate courts as evidence of a failure to teach. If the school is to provide facilities and means for learning, such as curricula and instruction, and the student and his or her family are responsible for using those facilities and means, then the managerial responsibility for learning should be placed at the point of responsibility—in the home. And, if the family and the student are ultimately responsible for learning, then information gathered by the teacher useful in making classroom management decisions should be made available to those individuals who are able to exert influence and control over student learning.

If the locus of control lies within the family, then it is the family which needs information gathered by the school for assessing and reporting on student behavior and progress. Teachers capture much of the detail about student academic production and achievement which parents could use to monitor the educational progress of their child. This information, collected weekly, if not daily, is generated through assignments, quizzes and tests, condensed into a letter grade, and sent to parents every six or nine weeks and at the end of the semester or school year. To what end this information benefits the family may be proportionally related to its availability and dissemination.

METHODOLOGY

An experimental design using treatment and control groups was chosen as a means of determining the effect of increasing the flow of information about student productivity and achievement from the teacher to the student's family. The experiment was conducted at a Southern California comprehensive high school with a student population of about 1450. Ethnic distribution at the school was approximately 67 percent Hispanic, 26 percent White, and 7 percent other. District sponsorship of the study included authorization to use district letterhead for cover letters mailed to the family contacts.

At this school each semester comprised three standard grading periods called triads. Data was collected over four standard grading periods, three triads of the fall semester, 1991, and the first triad of the spring semester, 1992. The first triad in the fall was used to gather baseline data on both treatment and control groups. Treatment was conducted during the following two triads of the first semester. Treatment class students received weekly progress reports during the middle two triads of the study. These progress reports were generated by the teacher using a computerized grading program. Students were expected to take the reports home each Monday. The family contact was to sign a "Communication Receipt" as evidence of receiving the report and send it back with the student the next day. The intent was to maintain an expectation of regularly scheduled communication between the teacher and family. If circumstances prevented the teacher from sending the scheduled progress reports, a form notifying families of the delay and naming a date when the report should arrive was to be sent in place of the report. District grade reports were made available to all students at the end of each triad.

Four mathematics teachers were selected to participate in the study on the basis of their interest in the project and familiarity with and interest in using a computerized grade program. Each teacher had at least two classes with identical content, one of which was identified as the treatment class in which the students received weekly progress reports during the two treatment triads, and the other section which served as the control class that received only the regular district progress reports at the end of each triad.

Families of students in classes selected for treatment were invited to participate in the high school School/Home Communication Project. Every student in each of the treatment classes was given a progress report each Monday during the two treatment triads. Solicitation of a family contact was a device intended to foster commitment on the part of the respondent. The decision to include all treatment class students in the process was intended to preclude a sense of voluntary participation by any student that might lead to a refusal to participate. Students were used as couriers, as is the custom in this school district, to carry communications between school and home, but no student was required to participate and no action was taken against any student for refusing to carry papers

between school and home or home and school.

Printouts of teachers' gradebooks were collected weekly. This practice provided an opportunity for the project director to monitor each teacher's adherence to project requirements, answer questions related to procedural problems, and discuss possible solutions for anticipated problems. Data collected at the end of each triad were labeled by Week 7, 13, 19, or 26 and used for quantitative analyses.

Every effort was made to ensure as little difference as possible between paired classes. Each teacher's treatment and control classes received the same lessons, assignments, quizzes, and tests. Time of day was considered in the selection of treatment and control classes to reduce any effect on students that might result from taking morning or afternoon classes. No teachers other than the four involved in the project used a computerized grade program and no student in the school who was not in a treatment class received a special grade report during the four triads of the study.

Family contact interviews were conducted at the end of the study. The specific interest of each interview was to determine the value to the family of the teacher reports on student progress. Secondary considerations for these interviews centered on the relationship between the family contact and the child, how the child's time was structured by adults in the home, and conflict resolution strategies of both family members and the child.

QUANTITATIVE FINDINGS

Quantitative data were collected weekly, but only accumulated data from those weeks coinciding with the end of triads were used for analyses. These were the weeks (7, 13, 19, and 26) when all student grades were submitted to data processing. From those data the district compiled grade cards for each student. Report cards were usually available to families within two weeks of the end of the triad. Since these were the only reports received by control group students and their families, the decision was made to compare the groups at district grade reporting intervals. To provide for a fair statistical comparison of the effect of family knowledge on student academic productivity and achievement, the decision was made to confine data analyses to standardized grade reporting intervals correlative with the school district reporting re-

quirement.

Prior to treatment, data were collected during the first seven weeks of the study to establish a baseline against which later findings could be compared over time. The t-test findings for baseline data comparing treatment and control groups revealed no observable differences between the groups. Variations noted for each of the variables and constructs at Week 7 were attributable to chance.

The construct *Grade Percentage* was comprised of two variables, *Assignment Points Earned* and *Quiz/Test Points*. As separate variables, neither reached significance, although a trend toward significance persisted over the course of the study. However, in combination, as measured by the *Grade Percentage* construct at Week 26, the two variables did mark a statistical difference ($F=5.249, p<.025$) between treatment and control groups. Comparison of graphed means for the *Assignment Points Earned* variable and the *Quiz/Test Points* variable indicate that differences favored the treatment group students (Figures 1 and 2).

The variable *Assignment Points Earned* is closely linked to the variable *Assignments Turned In*. There is a noticeable relationship between the number of assignments a student turned in and the total points earned for those assignments (Figures 1 and 3). Four factors were considered which might affect the number of assignments that a student turns in. First, the student's familiarity with the concepts and skills presented in the assignment affect his or her disposition to attempt and/or complete the assignment. Second, the student's personal belief in the relationship between course grade and assignments turned in might be a factor in not turning in assignments that have been completed. This phenomenon is not unusual among students and has never been explained by any student to the satisfaction of the writer. Third, the student might fail to do the assignment because of a lack of enabling skills and knowledge. Such students often hide their lack of knowledge, and, it seems, would prefer to appear disinterested in the course than have anyone discover their lack of knowledge. Conversations with these students over the years led the writer to attribute this behavior to a belief in predetermined intelligence quotients and innate capabilities that are probably thought to be inherited from family members who gave comfort by relating their own school

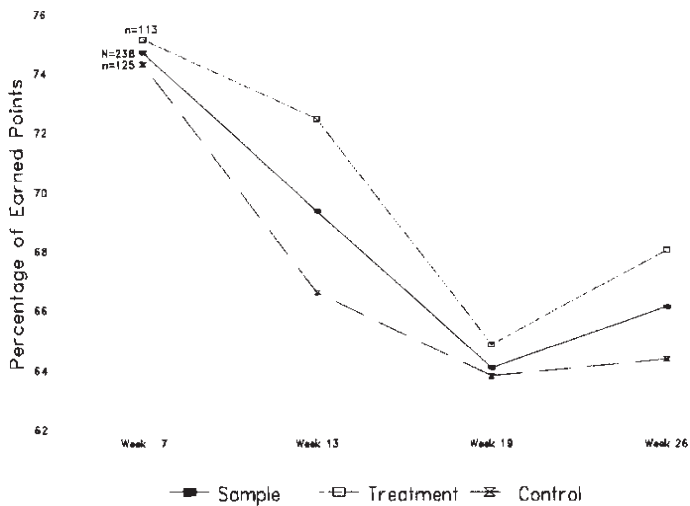


Figure 1
Assignment Points Earned
Group Means by Data Collection Interval

failure. Finally, it is possible that parents do not see a relation between assignments and achievement. Many families hold a view of seatwork as a classroom management device to promote a quiet, work-like environment with little, if any, relation to student learning. Any or all of these factors may have contributed to the denigration of the productivity means over time.

As shown in Figures 1 and 3, means for treatment and control groups were very high at Week 7, slid to lows at Week 19, the end of the semester, and rose at Week 26. That pattern would correlate well for Weeks 7

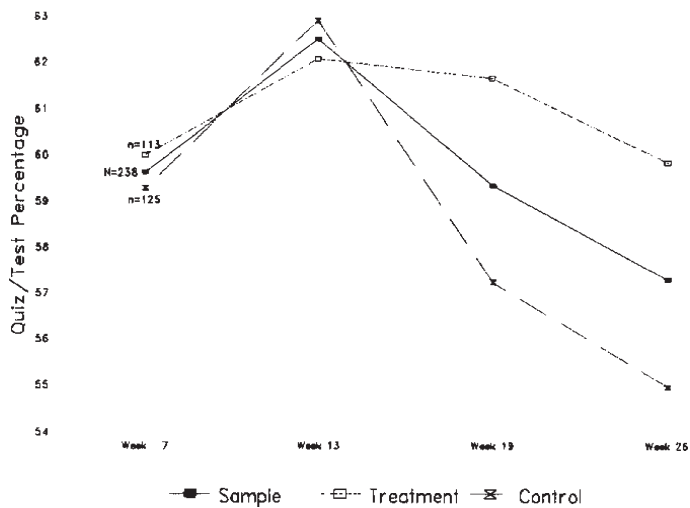


Figure 2
Quiz/Test Points
Group Means by Data Collection Interval

through 19 because traditional textbook and teacher instructional strategies place familiar material at the beginning of the course and gradually ease into new material. An upslope identified between Weeks 19 and 26 does not fit this pattern. The material presented during these weeks was new. This evidence that students turn in their assignments at the beginning of a semester may be indicative of a resolve to keep pace with instruction that many of the students are unable to sustain over the course of a semester.

Another factor that may have affected the *Assignments Turned In* variable was the acceptance of late assignments. Teachers in the study accepted students' late

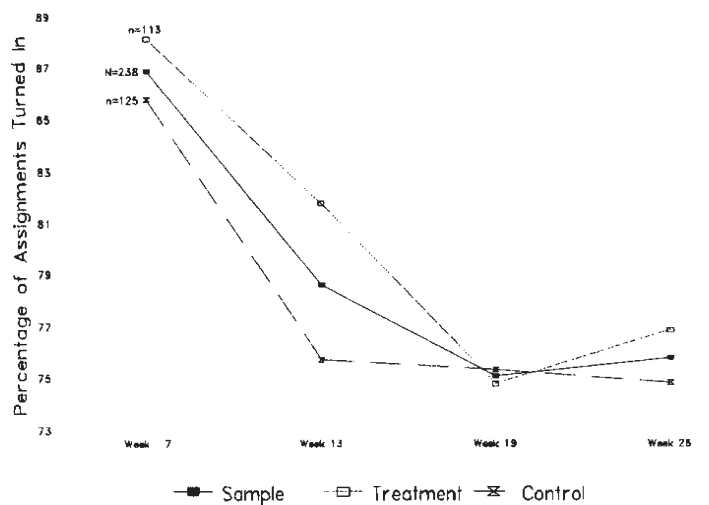


Figure 3
Assignments Turned In
Group Means by Data Collection Interval

work up to the last day of each triad. Work from a previous triad could not be turned in once grades had been formally recorded, but up to the last moment before teachers were to turn in grade collection sheets to the district, students were allowed to submit missing assignments. In effect, this practice produced very high means for both treatment and control groups and confounded any instrumental assessment that might have produced a credible differentiation between group means.

A graphic presentation of percentile distribution findings for *Assignments Turned In* at Week 13 (Figure 4) complemented analysis of variance results ($F=4.135$, $p<.05$). At Week 13 the greatest distance between group means was found at the 25th and 50th percent-

tiles. An analysis of variance at this interval disclosed a significant difference ($p < .05$) between groups. This effect disappeared by the end of the semester, at Week 19 ($F = .921$, $p = .338$), and by Week 26, the F ratio was .012 with a probability of .913.

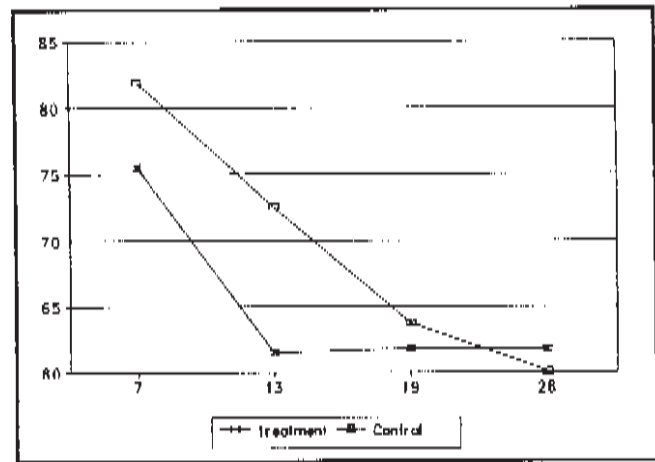
The 50th percentile medians at Week 7 for the treatment group were 94.54 and 91.33 for the control group. Nineteen weeks later, at the end of the study, the median for the treatment group was 82.50 and 80.14 for the control group. At the 75th percentile, the spread between group medians at Week 26 was 2.81 points.

Had it not been for the practice of accepting late work, a more definitive analysis of the *Assignments Turned In* variable might have been possible. The practice of accepting late work inflated rankings at the 50th and 75th percentiles to such an extent that there was no room in the curve tails for the analysis of variance test to distinguish between groups. The validity of this variable as a measure of student productivity was not affected by the teachers' acceptance of late work. The variable was a valid measure of assignments turned in. It did not, however, provide a measure of the effect of the treatment. To use this variable successfully would require the use of a deadline for turning in assignments.

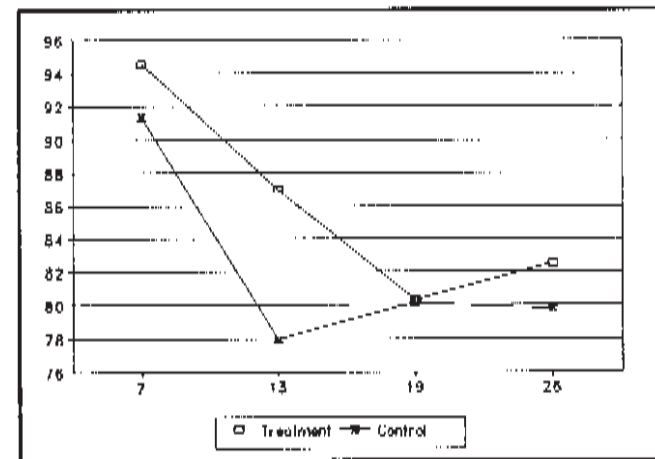
Assignment Points Earned naturally paralleled the results of *Assignments Turned In*. Figure 5 shows greater distances between treatment and control groups than evident for *Assignments Turned In* percentile distributions. However, the link between these two variables as a measure of student productivity was not directly correlated. The number of points earned on an assignment reflected the effort of the student to learn the material and complete the assignments. As a measure of student productivity, the *Assignment Points Earned* variable proved to be as robust as the *Assignments Turned In* variable.

Analysis of variance findings for the *Assignment Points Earned* variable at Week 13 showed an F ratio of 6.444, $p = .012$, which was comparable to the *Assignments Turned In* finding. At Week 19, both variables tended away from significance. However, during the last data collection interval these variables tended in opposite directions, with the *Assignment Points Earned* variable shifting toward significance with an F ratio of 1.687, $p = .195$ and, as stated previously, the *Assignments*

25th Percentile



50th Percentile



75th Percentile

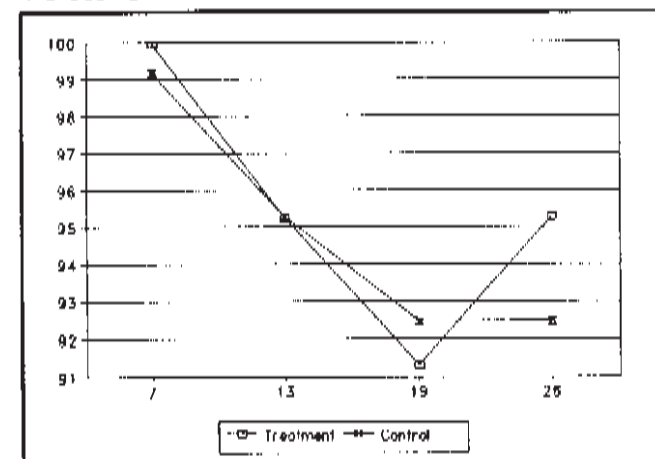
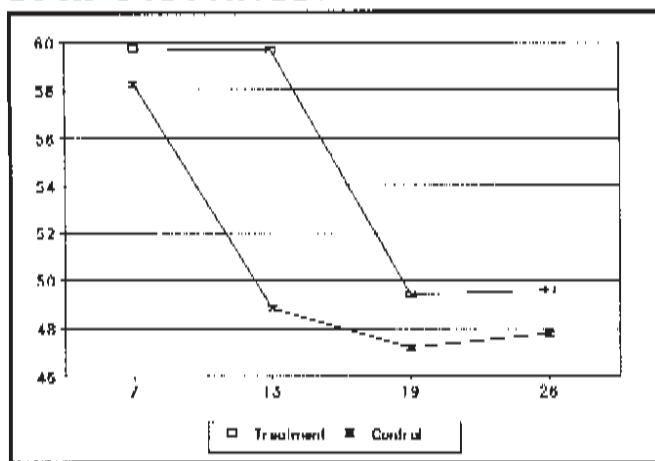
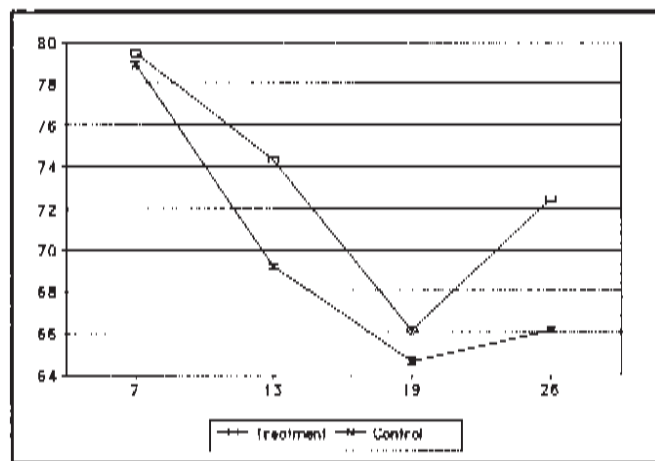


Figure 4
Assignments Turned In
Percentile Distributions

25th Percentile



50th Percentile



75th Percentile

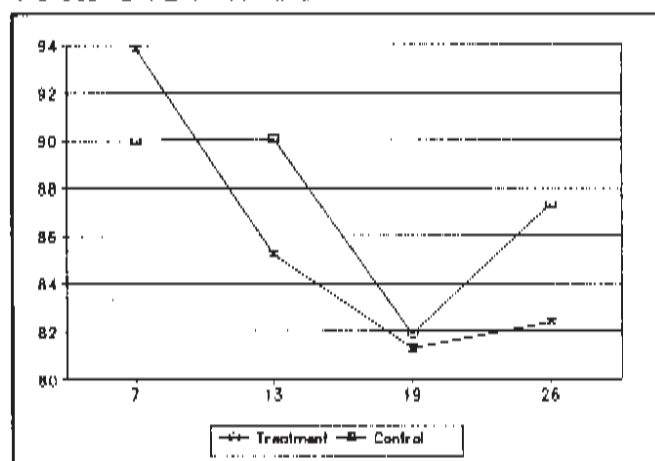


Figure 5
Assignments Points Earned
Percentile Distributions

Turned In variable reaching an extreme F-ratio of .012, $p = .913$.

Again, the practice of accepting late work may have had some affect on the *Assignment Points Earned* variable. It is, however, interesting to note the spread between groups at the 50th and 75th percentiles (Figure 4). Better control over the acceptance of late work might have provided for a testable distinction between groups.

Ethical considerations attendant in human research designs precluded the use of any device or procedure that interfered with practices known to promote student learning when such interference would reduce the student's course grade. A procedure for tracking the promptness or lateness of assignments would probably suffice as a means of controlling for the effect of late work on the productivity variables. Such a procedure would result in a duplicate set of gradebooks, one for the classroom teacher and one for the researcher, and would bear no empirical relation to the students' actual academic performance. In that event, the findings would represent a contrived model of the effect of family management on student learning and not the empirical reality from which the model would have been extracted. Apparently, the measurement of student productivity is an issue that requires rethinking.

The *Quiz/Test Points* variable almost reached significance in both of the final two data collection intervals of the study. This trend toward significance did not meet the alpha level requirement of .05 chosen for the study, but from an exploratory perspective, the shift from an initial F-ratio of .306, $p = .581$ at Week 13 to an F-ratio of 3.138, $p = .078$ at Week 19 and an F-ratio of 3.312, $p = .070$ at Week 26 coupled with graphic evidence of treatment impact at higher percentiles (Figure 6) supports a need for further investigation of the effect that frequent and detailed information about student academic productivity and achievement have on the family management of student learning.

The construct Grade Percentage was significant at Week 26 ($F = 5.249$, $p < .025$), controlled for Week 7 baseline covariate. Figure 7 presents graphic evidence of the ANOVA results. The percentile rankings presented in Figure 8 show the impact of treatment on students above the 25th percentile.

Examination of variable and construct percentile distributions reveals an increasing spread between treatment and control groups corresponding to increased percentile rank. ANOVAs were run for the grouped data only. The spread between treatment and control groups at the 75th percentile indicate a probable impact from the treatment on academically proficient students with supportive families.

QUALITATIVE ANALYSIS

Data gathered from conversations, written communications, notes, formal documents, and interviews confirmed the effectiveness of the conceptualization of the communications component of the hypothesis. The agreement between all parties to the study on the value of information on student productivity and academic progress was evident from the project's inception.

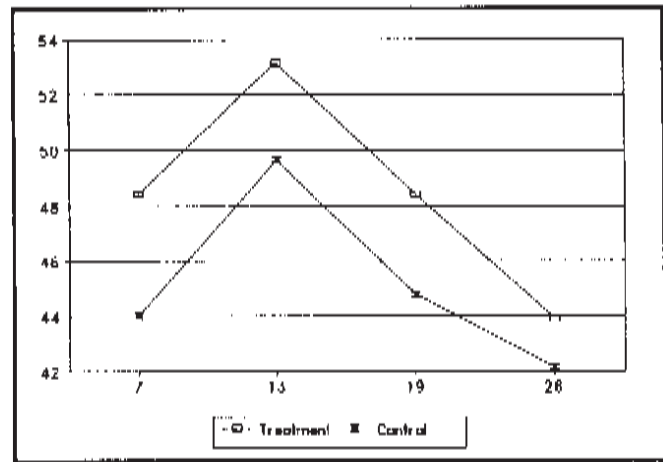
Administrative support from school district officials validated the study and sanctioned those procedures necessary to its successful completion. The participation of students as couriers was high, in part because of district approval for the use of School/Home Communication Project as a title and high school letterhead for project communications.

Site administrators showed some concern regarding the potential for divisiveness that might result between treatment and control group students. There was also some concern about the response of families to communications. A formal requirement of the principal centered on the right to preview any and all materials that would be sent to families and students prior to release. There was also a concern about using students to carry messages between school and home. None of these concerns impeded the project.

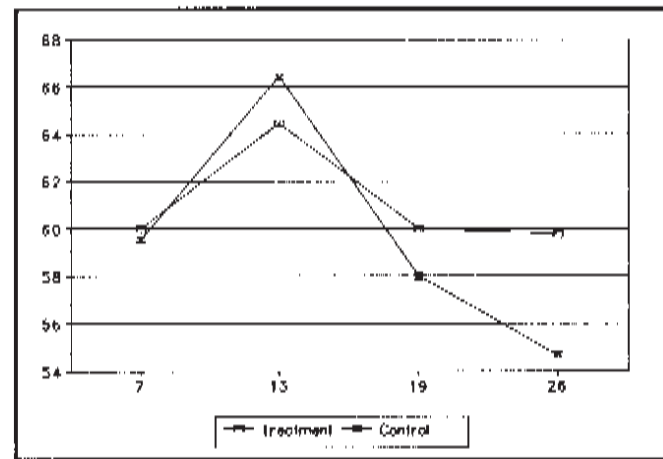
Students displayed a concern when initially informed of the project. Such concern is not unusual for students when their routine is disturbed. Some treatment group students neglected to take the envelopes containing information about the project and a letter requesting family participation. Telephone follow-ups resolved most of these problems. A replacement information packet was distributed at the family's request. No follow-up was done for a nonresponse to the second distribution.

The intrusive nature of the study design and the

25th Percentile



50th Percentile



75th Percentile

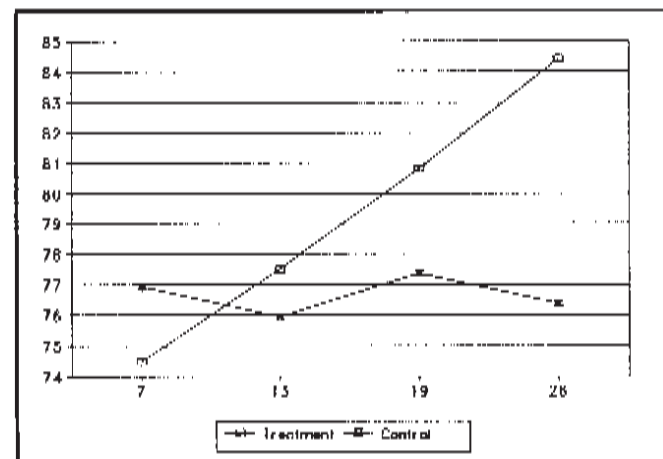


Figure 6
Quiz/Test Points
Percentile Distributions

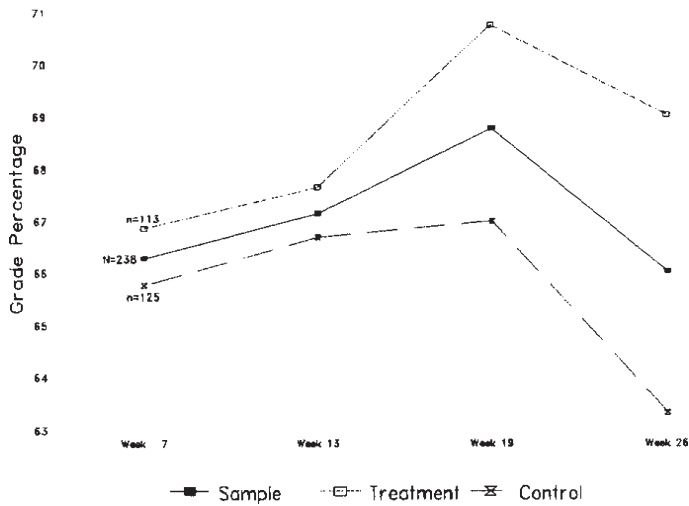
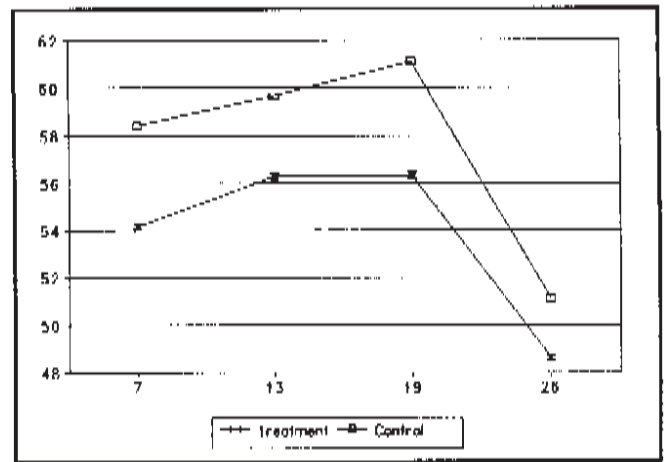


Figure 7
Grade Percentage
Group Means by Data Collection Interval

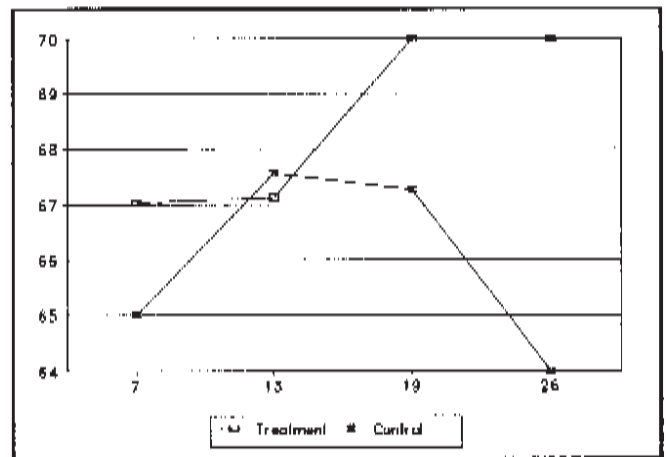
openly evident difference in the way students in treatment and control classes were apprised of their progress never appeared to present a problem. Students in control classes who inquired about receiving the progress reports were told that specific classes had been selected to receive the reports and because of the time involved in preparing the reports it was not possible to give them to all classes. Since there were no student or parent inquiries that went beyond the classroom teacher, it seemed that this answer satisfied the curiosity and concerns of students in the control group and in classes which were not participating in the study.

Teachers involved in the study were aware of the problems associated with grading papers, entering results into a grade program database, and printing out the student grades for family contacts each Monday of the treatment triads. The workload associated with the project was understood and agreed to by the three teachers who had consented to work with the project director who also participated in the study as a teacher. At the conclusion of the study, the participating teachers continued the practice of reporting on student progress to the families of all of their students independently of district requirements. A reporting cycle of alternating weeks with odd numbered period classes receiving reports one week and even numbered period classes the next satisfied the concern teachers had regarding an unmanageable drain on their time. In effect, this process almost matched the

25th Percentile



50th Percentile



75th Percentile

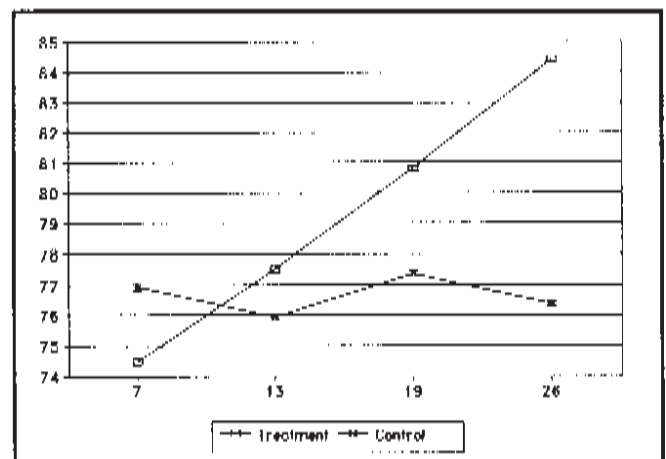


Figure 8
Grade Percentage
Percentile Distributions

time requirements of the study.

Teachers not involved in the project expressed interest in the amount of extra time required to enter grades into a computerized program and report to parents. Many of these teachers purchased the computerized gradebook program and began to use it as part of an instructional strategy. The compelling factor which appears to have prompted teachers to accept the challenge of computerizing their gradebook was their growing awareness that teachers who use these programs have ready availability to information upon requests by counselors, parents, and students. Teachers were impressed by the ability of computerized gradebook users to hand a parent a printout of a student's classroom conduct as indicated by number of assignments turned in. Coupled with the student's acceptance of responsibility for academic achievement, this method of recording and maintaining a gradebook was seen by teachers as a powerful tool in their efforts to affect student learning.

At the beginning of the study teachers expressed a concern that providing parents with detailed information about student progress would trigger numerous telephone conversations requesting explanations of grading practices and policies. Occasionally teachers were contacted, but in most instances the adult was seeking professional guidance to help the child become academically successful.

The intent of the study was to investigate the effect of frequent and detailed reporting of student progress to the student's family. The underlying procedural intent was to transfer the management of student learning from classroom to home. Other than the writer, who participated as one of the project teachers, none of the teachers in the study was aware of this design intention. It is interesting to note that the main effect which prompted teachers to adopt the practice of computerized grade reporting was the transfer of responsibility to the student. In effect, student learning became a parental or family responsibility since the students might fail to comprehend the importance of the deferred benefits of education.

Family contact response to the study was supportive and favorable from the outset. Unsolicited comments indicated the acceptance with which project intentions were greeted by the adults who obviously cared about

what their children were doing in school. The only complaint was that frequent and detailed reports were not available from all teachers. That plea was heard most often from the families of students who were having academic difficulties in several classes.

Comments that arrived on Communication Receipts and notes and comments delivered in person revealed feelings of parental empowerment generated by an increase in information. This immediate reaction by the family to the benefit of receiving information about the student was welcomed by the teachers. Teachers discussed differences in parents' attitudes and in the responsiveness of treatment class students to the instructional requirements. This sense of goodwill may have been a result of teachers feeling positive about their involvement in the study. In that case, the responsiveness of parents may have been a result of the teachers' attitude. Whatever the cause, the reality of parental approval of the frequency and detail of the computerized progress reports was well documented in writing by many of the family respondents.

In the interviews conducted after the 26th week of the study, all of the respondents expressed their satisfaction with the project. Each of them appreciated the frequency of the reports, but, although aware of the detail, had not always known how to read them. Many were dependent upon their children to explain the meaning of the reports and the procedures and policies of the school and teacher. While family members did not always believe what their child told them, they seemed to be obliged to accept the explanation. Parents usually waited for face-to-face encounters with teachers to confirm or disconfirm their children's explanations.

IMPLICATIONS

Analysis of variance significance of the *Grade Percentage* construct at Week 26 ($F=5.249$, $p<.025$), controlled for Week 7 baseline covariate, and the graphic comparisons shown in Figures 7 and 8 present a compelling justification for continuation of research into the underlying conceptualization of this study that the family management of student learning affects student achievement. The *Grade Percentage* construct, comprised of achievement and productivity measures, illustrated the effect on student academic success of frequent and detailed progress reporting to the family. Quantitative and qualitative findings partially

supported the research question: Given equivalent course content and the same instructor, will more frequent, more detailed reporting of student progress to a single, responsible family contact result in statistically significant improvement in a student's 1) assignment completion ratio as a measure of productivity and 2) academic achievement as measured by course grade? A procedural problem resulting in a neglect to distinguish between assignments turned in on time and those submitted late diminished the value of the *Assignments Turned In* variable as a measure of student productivity.

The results of the study support a rethinking of the traditional view of the teacher as the manager of student learning. Teachers do gather pertinent and helpful information from student assessments. This study demonstrated that sending available information to the family frequently and in detail did have an effect on the student's grade. This experimental intervention demonstrated the value of detailed and frequent progress reporting to the families of students as compared to the traditional grade reporting practice of providing single letter grades for each subject two, three, or four times a year. Based on data from this study, it would seem that the benefit of providing information far exceeds its utility to teachers. There is no question that teachers need information upon which to base instructional decisions. The study illustrated the parallel that families need this data as well to inform decisions made in the home that are of consequence to the student's academic performance.

Contemporary research supports a reconsideration of the customary belief that nontraditional parenting has little effect on student achievement. What may negatively affect student achievement is the distancing between school and home resulting from an absence of timely and pertinent information that would allow the family to perform its managerial function in raising its children. The results of this study indicate that when families are aware of their child's academic performance in time, they accept their responsibility as

managers of their children's learning and do affect the student's academic productivity and achievement.

Future research might concentrate on distinguishing between the student and family effect of progress reporting. Some consideration might be given to defining optimal reporting frequencies that teachers could comfortably meet. A better measure of achievement might be obtained with pre-and post-testing. Productivity might better be measured by initial assignment response rates as opposed to rates that reflect a teacher policy of accepting late work up to and including the last day of the triad. Interview inquiries might be made into the beliefs that both families and students have concerning the relationship between assignments and performance on quizzes and tests. No significant change was noted at and below the 25th percentile on any of the variables or the construct. Research specifically targeting the families of students in the 25th percentile might be more profitable in terms of developing an understanding of the relationship between family management of student learning and student academic success.

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