

ALTERNATE TACTICS IN HOMEWORK COLLECTION
THAT MAY STIMULATE AN INCREASE IN HOMEWORK COMPLETION
AND ACADEMIC ACHIEVEMENT,

MASTER'S PROJECT

Submitted to the School of Education
University of Dayton, in Partial Fulfillment
of the requirements for the Degree
Master of Science in Education

by

Dianne S. Baygents
School of Education
UNIVERSITY OF DAYTON
Dayton, Ohio
December 1992

UNIVERSITY OF DAYTON ROESCH LIBRARY

Approved by:

Official Advisor

TABLE OF CONTENTS

	Page
A. Purpose of the Study.....	1
B. Justification for the Study.....	1
C. Hypothesis.....	3
D. Definition of Terms.....	3
E. Assumptions.....	4
F. Review of the Literature.....	5
G. Methodology.....	7
H. Data Analysis.....	9
I. Results.....	10
J. Summary.....	17
K. Conclusions.....	19
L. Recommendations.....	20
M. Bibliography.....	21

LIST OF TABLES

Table I	Biology Test Scores Daily Assignment Collection Group.....	11
Table II	Biology Test Scores Random Assignment Collection Group.....	12
Table III	Biology Test Scores Test Day Assignment Collection Group....	13
Table IV	Group Comparison of Test Grades Bar Graph.....	14
Table V	Group Comparison of Test Grades Line Graph.....	15
Table VI	Analysis of Variance with Unequal Sample Sizes.....	16

CHAPTER 1

IDENTIFICATION OF THE RESEARCH PROBLEM

Purpose of the Study

Most research shows a positive correlation between homework and academic achievement. (Keith, 1982). "Studies concerning learning as a function of time certainly indicate that homework, as an extension of learning time, may make a significant difference in student achievement." (Turvey, 1986). Research also shows that, unless the homework is evaluated and commented upon in a meaningful fashion, it is of little value. (Paschal, Weinstein, Walberg, 1985). A system of accountability for homework must be established to benefit both students and educators. Collecting, checking, and grading each student's homework requires more time than most teachers have available. A systematic homework approach must be developed that leads to greater homework completion and increased student achievement. The purpose of this study was to investigate alternate homework collection strategies that would stimulate increased homework completion.

Justification for the Study

My interest in homework research revolves around observations of academic achievement in my students. Homework does appear to increase

student achievement when the homework itself is assigned and evaluated in some systematic manner. Keith (1982) found that with one to three hours of homework a week, a low ability student could get grades comparable to those of an average ability student who did no homework. In my classroom, when assigned homework is not evaluated, the percent of homework completion and academic achievement decreased in my low to average ability students as measured by test scores. We, as educators, should have a valid concern with student failure to complete homework because of the direct effect it may have on academic achievement.

I currently teach three low level mathematics classes and three high school biology classes. I work with approximately 150 students per day. To collect, check, and grade each student's assignment daily is an almost insurmountable task in the subject areas I teach. Yet, this need for constant evaluation is paramount to the success of my students. These students require continuous feedback to keep them motivated. A system of accountability must be established to let students know that homework is important, expected, and that they would be held responsible for it. With this study, I had investigated three specific tactics in homework collection and evaluation: 1) daily collection of assignments; 2) random collection of assignments; and 3) test day collection of assignments. I

hoped to determine an association between selected collection strategies and performance on teacher prepared, non-standardized tests. Using statistically validated results, I reached a conclusion that will allow me to make an appropriate decision in the collection and evaluation of homework in the future.

Hypothesis

It was hypothesized that there would be no difference between the three groups in scores on teacher made tests. Whether homework was collected daily, randomly or as a unit would not alter test score achievement.

Definition of Terms

Daily assignment collection class.

A biology class whose students were evaluated by turning in required homework assignments daily for evaluation.

Random assignment collection class.

A biology class whose students were evaluated by turning in required homework assignments randomly. Each student was assigned a number. Five numbers were randomly generated daily. Students with these

numbers were required to submit their homework for evaluation.

Homework was graded, commented on, and promptly returned the following day.

Test-day assignment collection class.

A biology class whose students were evaluated by turning in required homework assignments at the completion of each chapter, on the day of the chapter test. Homework was graded, commented on, and promptly returned the following day.

Teacher made tests.

Achievement test prepared by the teacher to measure student learning in a specific area.

Assumptions

The sample for this experimental study was composed of students who were enrolled in one of my biology classes in the fall of 1991. These classes were assigned to the teacher through regular scheduling procedures. It was assumed that the three classes were homogeneous and represent a typical biology class.

Review of the Literature

Homework is an integral part of our educational system. It extends the length of time an individual is actively involved in the learning process. In 1982, Keith preformed a study that investigated the relationship between homework time and high school grades. Keith compared mean grades in high school as a function of time spent on homework. His conclusions were significant: an increase in time spent on homework has a positive effect on a student's grades in high school.

In 1988, Foyle and Bailey conducted research on 13 homework experiments in social studies. They reviewed these experiments with three questions in mind: (1) What type of test was used to measure achievement? (2) What was the nature of the homework involved? And (3) was the homework systematically planned? Foyle and Bailey found homework increased achievement results when the homework itself was systematically planned and carried out when compared to no homework. Homework, when evaluated, promotes responsibility and accountability.

In reviewing other research, homework increased achievement results when the homework was regularly assigned, regularly corrected and graded, and promptly returned. "Larger effects on achievement were found for homework that bears teachers' comments and grades. Assigned

homework produced more learning than no homework; and traditional homework was superior to non-traditional." (Paschal, Weinstein, and Walberg, 1984). Collecting, checking, and grading each student's homework daily requires more time than most teachers have available.

There is a definite need for experimental research that systematically examines different and less time consuming approaches to the collection and grading of homework assignments. A policy that not only motivates the students to greater homework completion, but also increases achievement results.

CHAPTER 2 METHODOLOGY

In the fall of 1991, each biology class that I taught was assigned to one of three homework collection strategies. The completed project consisted of 9th, 10th, and 11th grade students enrolled in my high school biology classes during the 1991-92 school year. The sample was a sample of convenience. Subjects for this study were obtained through regular scheduling procedures. Group I students, the daily assignment collection class, consisted of 11 females and 11 males. Time of this class was from 7:50 to 8:40 A.M. Group II students, the random assignment collection class, consisted of 11 females and 14 males. Time of this class was from 9:38 to 10:28 A.M. Group III students, the test day assignment collection class, consisted of 8 females and 12 males. Time of this class was from 10:32 to 11:22 A.M. All students in the study were white. Their average socioeconomic status was lower middle class.

All classes were told that homework was essential in this course. Each class was assigned the same homework and the same grading scale was used to evaluate their work. Only the method of collection varied. Homework was counted as 25% of their final grade. Excused absences were accepted and all missed work was made up by the student. Tests

that were not made up by the student were recorded with the student's final average for all tests taken. Length of study was nine weeks, one complete grading period.

At the beginning of each class period time was spent going over the previous night's homework assignment. Students in the *daily assignment collection class* were required to show their homework at the beginning of the class period. Their homework was quickly checked for complete answers and spot checked for accuracy. In this class, I walked up and down the aisles of desks quickly looking over each student's assignment. Students received full credit (5 points) for acceptable answers or no credit (0 points) for unacceptable answers.

Five students in the *random assignment collection class* were required to hand in their homework assignment at the beginning of the class period. Each student in this group was assigned a number corresponding to their placement on an alphabetical class list. Using a random number table, five numbers were selected each day. Absent students whose numbers were selected were disregarded and a new number was selected for that day. Only those students present were held accountable for that day's homework. Homework was graded on a one to ten scale based on accuracy and completion of the assignment. The

assignments were commented on and returned to the student on the following day.

Students in the *test day assignment collection class* were not required to hand in or show their homework that day. Homework was collected from this group on completion of the current chapter, on the day of the chapter test. All homework was quickly checked for complete answers and spot checked for accuracy. Students received full credit (5 points) for each assignment with acceptable answers and no credit for assignments with unacceptable answers. Homework was returned to these students on the following day.

Data Analysis

Evaluation of the effect of the homework strategies was based on a comparison of student achievement on teacher made tests within the three collection groups. Quality of homework was looked at in relation to the collection strategies. This information was treated in a statistically appropriate manner.

CHAPTER 3 RESULTS

Data for each study group was collected over a nine week period. It was assumed that the aptitude for the students in each group was selected from a normal distribution, and that the variance of the distribution was the same for all three groups.

TABLE I represents the scores of the students in the daily homework collection class. TABLE II represents the scores of the students in the random homework collection class. TABLE III represents the scores of the students in the test day assignment collection class. On each of the three tables, the nine week test grade average for each student is in the right-most column. The last row of each table, test averages, represents the average grade of each student in the group for a particular test. The average final grade for the entire group is also given.

TABLE IV compares results on the individual tests among the three groups. The class average for each group on the individual tests is used. TABLE V shows the trends within this set of data. TABLE V uses class averages for each group on individual tests.

TABLE VI provides information for an analysis of the hypothesis regarding homework collection strategies.

TABLE I

1991 BIOLOGY TEST SCORES
Daily Assignment Collection Group

STUDENT	CHAP 1	CHAP 2	CHAP 3	CHAP 4	CHAP 5	CHAP 6	CHAP 7	GRADE AVG
JESSICA A	92	48	76	66	77	83	88	75.71
BRANDY B	66	80	40	24	40	54	74	54.00
SHELLEY B	58	36	52	88	23	50	50	51.00
AMY C	74	76	88	66	83	66	91	77.71
JENNY C	82	80	96	70	70	69	91	79.71
CHAD C	52	56	72	58	57	56	74	60.71
MATT D	68	68	76	66	73	59	85	70.71
TOM E	90	92	84	66	63	59	91	77.86
KIM E	62	60	72	67.5	63	83	65	67.50
MICHAEL F	62	76	68	50	37	64	65	60.29
RYAN F	50	64	36	40	40	78	85	56.14
RICK F	66	44	72	34	50	60	80	58.00
SARA H	46	56	84	28	40	49	71	53.43
GEORGE J	74	60	80	60	53	59	91	68.14
JEFF M	58	52	76	42	27	54	41	50.00
AMY M	68	68	88	64	67	69	85	72.71
DAVID P	52	60	52	56	50	79	77	60.86
JAMI S	84	64	88	40	37	79	82	67.71
NATHAN S	86	76	92	68	47	78	65	73.14
TIM V	72	55	55	40	53	55	55	55.00
AMY B	34	36	41	41	47	41	47	41.00
BERNADINE L	52.5	40	64	42	70	46	53	52.50
TEST AVERAGES	68.0	63.1	73.7	55.5	54.3	66.5	75.2	64.28

Each column represents individual student scores on chapter tests one through seven. The final column, grade average, represents each student's average test grade over the nine week period. The last row of data, test averages, represents the class average for each individual test. The last entry represents the average final grade for the entire class over the nine week period.

1991 BIOLOGY TEST SCORES
Random Assignment Collection Group

STUDENT	CHAP 1	CHAP 2	CHAP 3	CHAP 4	CHAP 5	CHAP 6	CHAP 7	GRADE AVG
MIKE B	74	80	92	64	47	83	80	74.29
AMBER B	90	84	92	70	67	85	85	81.86
SHAUN B	59.33	56	52	42	80	79	47	59.33
NORM C	88	56	80	70	75	56	80	72.14
BRENT C	44	49.25	49.25	50	37	66	49.25	49.25
MIKE F	82	68	88	56	23	54	71	63.14
APRIL F	90	84	79.33	72	80	65	85	79.33
HEATHER G	86	68	76	70	73	77	85	76.43
KEVIN H	80	56	68	92	80	89	94	79.86
JESSICA H	68	76	76	74	60	77	80	73.00
KEVIN J	58	76	72	46	53	73	68	63.71
BRANDON K	46	20	60	36	27	40	62	41.57
KIM M	76	80	80	58	73	75	88	75.71
BRIAN M	88	88	84	80	83	96	91	87.14
KORINA M	66	60	68	32	40	69	91	60.86
ANTHONY M	50	52	44	40	30	53	53	46.00
JESSE R	78	68	80	64	70	74	97	75.86
LYDIA R	94	80	76	82.33	63	81	100	82.33
KIM R	88	88	88	88	70	89	94	86.43
JAMI S	70	52	84	52	40	70	68	62.29
JASON S	92	92	96	88	67	79	91	86.43
JAMIE S	76	60	48	46	50	54	65	57.00
BECKY W	70	76	84	58	40	73	74	67.86
KATIE W	82	64	68	30	60	83	74	65.86
SHANE W	84	80	84	68	63	83	88	78.57
TEST AVERAGE	75.8	69.3	75.7	60.2	58	72.9	79.6	69.85

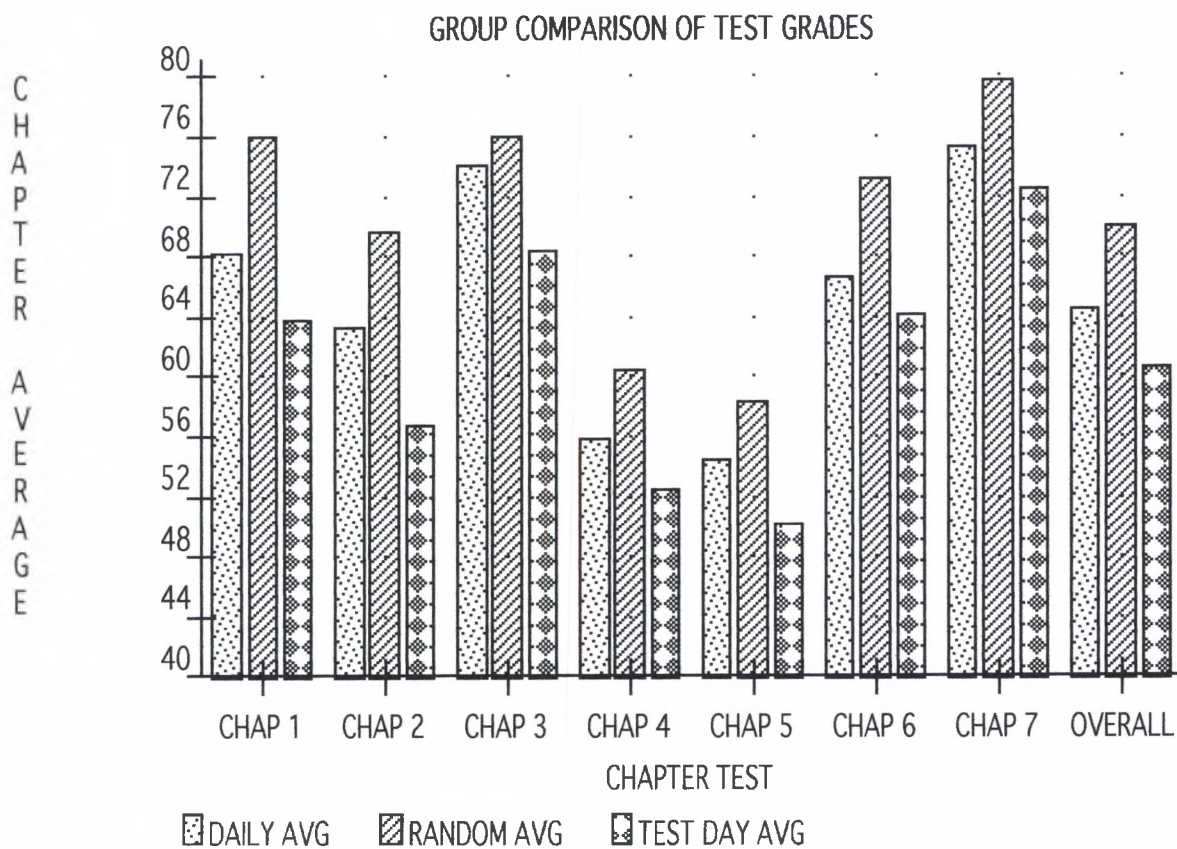
Each column represents individual student scores on chapter tests one through seven. The final column, grade average, represents each student's average test grade over the nine week period. The last row of data, test averages, represents the class average for each individual test. The last entry represents the average final grade for the entire class over the nine week period.

1991 BIOLOGY TEST SCORES
Test Day Assignment Collection Class

STUDENT	CHAP 1	CHAP 2	CHAP 3	CHAP 4	CHAP 5	CHAP 6	CHAP 7	GRADE AVG
ARTHUR B	70	56	44	46	37	63	65	54.43
CHRISTINE B	68	48	80	58	63	59	80	65.14
JOSEPH B	62	60	76	60	37	55	80	61.43
DONALD C	30	48	52	36	35	48	59	44.00
MIKE C	62	68	72	40	37	78	85	63.14
LEAH G	72	52	60	50	63	59.4	59.4	59.40
BELYNDA H	82	92	84	72	60	79	71	77.14
JOSH H	48	48.17	68	30	20	55	68	48.17
LARRY H	54	32	60	26	47	54	45.5	45.50
DEL J	34	36	36.4	36.4	43	22	47	36.40
LYNN L	80	64	76	66	73	68	80	72.43
WENDY L	58	56	56	52	60	63	65	58.57
JAMIE M	40	52	48	44	47	56	71	51.14
JENNY M	52	44	44	24	53	61	38	45.14
SARAH M	82	64	76	56	60	83	80	71.57
TONY M	68	52	92	68	37	73	85	67.86
JASON S	68	72	72	72	50	75	80	69.86
JERRY S	92	60	84	72	77	79	82	78.00
TRACY S	82	72	80	78	63	81	94	78.57
JEREMY W	61	61	80	61	47	61	56	61.00
DAWN Y	68	44	60	42	43	66	88	58.71
TEST AVERAGES	63.6	56.4	68.2	52.2	50.1	64.1	72.3	60.36

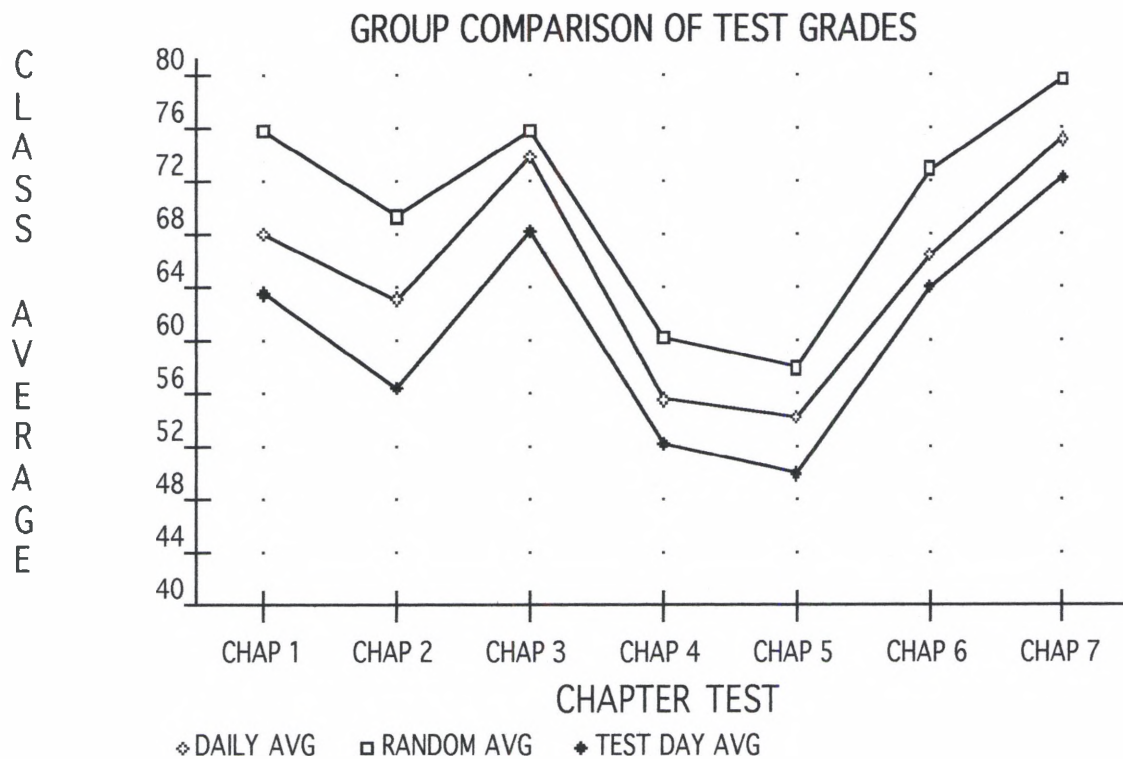
Each column represents individual student scores on chapter tests one through seven. The final column, grade average, represents each student's average test grade over the nine week period. The last row of data, test averages, represents the class average for each individual test. The last entry represents the average final grade for the entire class over the nine week period.

TABLE IV



Comparison of the class average for the individual tests for the three groups in this study

TABLE V



Comparison of the class averages for the individual tests for the three study groups.

TABLE VI

ANALYSIS OF VARIANCE WITH UNEQUAL SAMPLE SIZES

SOURCE OF VARIATION	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE VARIANCE	F RATIO	CRITICAL VALUE
BETWEEN MEANS (TREATMENT)	1018.69	2	509.3450	3.3975	3.15
WITHIN SAMPLES (ERROR)	9294.96	62	149.9187		
TOTAL	10313.65	64			

$$\Pr(F < x) = .95$$

TABLE VI provides information for an analysis of the hypothesis regarding homework collection strategies.

The 95% critical value for a F distribution with 2 and 62 degrees of freedom is about 3.15. The experimental value observed was approximately 3.40. This led to the conclusion that there was a significant difference in the performance of students among the three homework collection strategies. The null hypothesis was rejected.

CHAPTER 4 SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

Homework is the key to better understanding of scientific and mathematical concepts. Homework should be a daily event in the academic routine of teachers and students. Most research shows a positive correlation between homework time and academic achievement. Homework increased achievement results when the homework was regularly assigned, collected, graded, and promptly returned. As educators, we should have a valid concern with student failure to complete homework because of the direct effect it may have on academic achievement. Collecting, checking, and grading each student's homework requires more time than most teachers have available. How can we, as educators, make students more responsible for daily homework completion? A system of accountability for homework must be established in our everyday routine. There is a definite need for experimental research that systematically examines different and less time consuming approaches to the collection and grading of homework assignments. A policy that not only motivates the students to greater homework completion, but also increases achievement results.

The purpose of this study was to investigate possible alternate

tactics in homework collection that may stimulate an increase in homework completion. Three specific tactics in homework collection and evaluation were investigated: 1) daily collection of assignments; 2) random collection of assignments; and 3) test day collection of assignments.

This study was conducted over a nine week period at a suburban high school. The completed project consisted of 9th, 10th, and 11th grade students enrolled in one of my three biology classes in the fall of 1991. All classes were told that homework was an integral and essential part of the course. At the beginning of each class period, time was spent going over the previous night's homework assignment. Each class was assigned the same homework, the same grading scale, and a specific method of homework collection.

Students in the daily assignment class were required to show their homework at the beginning of the class period. Their homework was quickly checked for complete answers and spot checked for accuracy. Students received full credit for acceptable answers or no credit for incomplete or unacceptable answers.

Five students in the random assignment collection class were required to hand in their homework assignment at the beginning of the class period.

Each student in this group was assigned a number corresponding to their placement on an alphabetical class list. Using a random number table, five numbers were selected each day. Homework was graded on a one to ten scale based on accuracy and completion of the assignment. The assignments were commented on and returned to the student the following day.

In group III, students in the test day assignment collection class were not required to hand in or show their homework that day. Homework was collected from this group on completion of the current chapter, on the day of the chapter test. All homework was quickly checked for complete answers and spot checked for accuracy. Students received full credit for each assignment with acceptable answers and no credit for assignments with unacceptable answers. Homework was returned to these students on the following day.

Evaluation of the effect of the homework strategies was based on a comparison of student test achievement on teacher made tests of the three collection groups.

Conclusions

The test scores of the three homework collection groups revealed a

higher mean score for the random collection group than for the other two groups. The findings were subjected to an analysis of variance test with unequal sample sizes. The results of this study show a significant relationship between homework collection strategies and scores on teacher made tests. Therefore, the null hypothesis was rejected.

Based on the statistical significance of the student groups, it would appear that random collection of homework assignments would be beneficial incorporated in the classroom routine. Completion of assignments increased as well as academic achievement on teacher made tests. Least favored of the investigated strategies would be a unit or notebook collection of homework assignments.

Recommendations

In future studies, it may be advisable to alternate the homework strategies between the classes every nine weeks. This would rule out the possibility of nonhomogeneous aptitude groups, as well as, any affect the time of day may have on academic achievement. I do not recommend doing this experiment during the first quarter of a school year. The unsatisfactory homework habits of my students' in the test day collection group were hard to change once established.

Bibliography

Braswell, James. "One Point of View: Improving Performance." *Arithmetic Teacher* 32(1985): 38.

Callahan, Joseph F.; Clark Leonard H. "Teaching in the Middle and Secondary Schools Planning for Competence." (3rd ed.). New York: Macmillan Publishing Company (1988).

Foyle, Harvey C.; Bailey, Gerald D. "Homework Experiments in Social Studies: Implications for Teaching." *Social Education* 52(1988): 292-294, 296-298.

Johnson, Charles W. "The Association between Testing Strategies and Performance in College Algebra, Attitude towards Mathematics, and Attrition Rate." *School Science and Mathematics* 89(1989): 468-477.

Keith, Timothy Z. "Time Spent on Homework and High School Grades: A Large-Sample Path Analysis." *Journal of Educational Psychology* 75(1982): 248-253.

Palardy, J. Michael "The Effect of Homework Policies on Student Achievement." *NASSP Bulletin* 72(1988): 14-17.

Partin, Ronald L. "Homework That Helps." *Clearing House* 60(1986): 118-119.

Paschal, R. A.; Weinstein, T.; and Walberg, H. J. "Homework's Powerful Effects on Learning." *Educational Leadership* 42(1985): 76-79.

Paschal, R. A.; Weinstein, T.; Walberg, H. J. "The Effects of Homework on Learning: A quantitative Synthesis." *The Journal of Educational Research* 78(1984): 97-104.

Strother, Deborah Burnett "Homework: Too Much, Just Right, or Not Enough?" *Phi Delta Kappan* 65(1984): 423-426.

Bibliography

Braswell, James. "One Point of View: Improving Performance." *Arithmetic Teacher* 32(1985): 38.

Callahan, Joseph F.; Clark Leonard H. "Teaching in the Middle and Secondary Schools Planning for Competence." (3rd ed.). New York: Macmillan Publishing Company (1988).

Foyle, Harvey C.; Bailey, Gerald D. "Homework Experiments in Social Studies: Implications for Teaching." *Social Education* 52(1988): 292-294, 296-298.

Johnson, Charles W. "The Association between Testing Strategies and Performance in College Algebra, Attitude towards Mathematics, and Attrition Rate." *School Science and Mathematics* 89(1989): 468-477.

Keith, Timothy Z. "Time Spent on Homework and High School Grades: A Large-Sample Path Analysis." *Journal of Educational Psychology* 75(1982): 248-253.

Palardy, J. Michael "The Effect of Homework Policies on Student Achievement." *NASSP Bulletin* 72(1988): 14-17.

Partin, Ronald L. "Homework That Helps." *Clearing House* 60(1986): 118-119.

Paschal, R. A.; Weinstein, T.; and Walberg, H. J. "Homework's Powerful Effects on Learning." *Educational Leadership* 42(1985): 76-79.

Paschal, R. A.; Weinstein, T.; Walberg, H. J. "The Effects of Homework on Learning: A quantitative Synthesis." *The Journal of Educational Research* 78(1984): 97-104.

Strother, Deborah Burnett "Homework: Too Much, Just Right, or Not Enough?" *Phi Delta Kappan* 65(1984): 423-426.

Suydam, Marilyn N. "Research Report:Homework: Yes or No?" Arithmetic Teacher 32(1985): 56.

Turvey, Joel S. "Homework-Its Importance to Student Achievement." NASSP Bulletin 70(1986): 27-35.