School Improvement Research Series

Research You Can Use

Close-Up #4

Monitoring Student Learning in the Classroom

Kathleen Cotton

INTRODUCTION

The body of educational research literature which has come to be known as the effective schooling research identifies the practice of monitoring student learning as an essential component of high-quality education. The careful monitoring of student progress is shown in the literature to be one of the major factors differentiating effective schools and teachers from ineffective ones. Indeed, those analyses which have sought to determine the relative effect sizes of different instructional practices have identified monitoring student progress as a strong predictor of student achievement.

What does "monitoring student learning" involve? The American Heritage dictionary defines monitoring as KEEPING WATCH OVER; SUPERVISING and also gives another more specific meaning: TO SCRUTINIZE OR CHECK **SYSTEMATICALLY WITH A VIEW TO COLLECTING CERTAIN** SPECIFIED CATEGORIES OF DATA. As the term is used in educational settings, monitoring takes in both these meanings and is closely connected with the related functions of record keeping, reporting, and decision making.

DEFINITION

For our purposes here we shall define monitoring as **ACTIVITIES PURSUED BY TEACHERS TO KEEP TRACK OF STUDENT LEARNING FOR PURPOSES OF MAKING INSTRUCTIONAL DECISIONS AND PROVIDING FEEDBACK TO STUDENTS ON THEIR PROGRESS.** When educators speak of classroom monitoring, they generally refer to the following teacher behaviors:

- Questioning students during classroom discussions to check their understanding of the material being taught
- Circulating around the classroom during seatwork and engaging in one-to-one contacts with students about their work
- Assigning, collecting, and correcting homework; recording completion and grades
- Conducting periodic reviews with students to confirm their grasp of learning material and

identify gaps in their knowledge and understanding
- Administering and correcting tests; recording scores
- Reviewing student performance data collected and recorded and using these data to make needed adjustments in instruction

Defined this way, monitoring obviously includes many kinds of activities, but it is important to note that the present analysis does not address issues relating to schoolwide or district-level monitoring of student learning. It is not concerned, except incidentally, with monitoring students' behavior. And it provides only cursory information on such matters as teacher training in monitoring and assessment practices or the processes teachers follow in putting monitoring information to use.

Instead, the focus here is classroom-level monitoring of student learning progress and what research says about the relationships between such monitoring and the student outcomes of achievement, attitudes and social behavior.

THE RESEARCH ON MONITORING STUDENT LEARNING

Several dozen documents were reviewed in preparation for this report. Of these, 23 are studies or reviews which clearly indicate a relationship between one or more forms of monitoring student learning and student outcomes--usually achievement. Fifteen documents are reviews and eight are studies. Five involve elementary students, three involve secondary students, and fifteen are concerned with the entire K-12 range. Fourteen have general achievement as the dependent variable. Language arts is the outcome focus of three documents. Others include: mathematics--3, science--2, social studies--1, and student attitudes--5. Some investigations were concerned with more than one outcome area. Nineteen of the studies concern regular education students of various races, socioeconomic groups, and ability levels. Three have special education subjects, and one focuses on Chapter 1 participants.

Of the kinds of monitoring functions investigated, teacher questioning to check student understanding is the focus of three reports. Others include: monitoring seat work4, assigning/collecting/grading homework--2, conducting periodic reviews in class--2, formative testing--2, and reviewing records--3. Nine of the reports focused on two or more of these functions.

Findings pertaining to each of these kinds of classroom monitoring--and to monitoring in general--are cited in the sections which follow.

QUESTIONING AND OTHER LEARNING PROBES

The term "learning probe" refers to a variety of ways that teachers can ask for brief student responses to lesson content so as to determine their understanding of what is being taught. Questions to the class, quizzes, and other means of calling upon students to demonstrate their understanding are methods used by teachers to find out if their instruction is "working" or if it needs to be adjusted in some way.

Does the use of learning probes have a beneficial effect on student achievement? The research indicates that this approach can indeed produce achievement benefits. Particularly effective techniques include:

- Keeping questions at an appropriate level of difficulty; that is, at a level where most students can experience a high degree of success in answering
- Paying close attention to who is answering questions during classroom discussion and calling upon non volunteers
- Asking students to comment or elaborate on one another's answers
- Using information on students levels of understanding to increase the pace of instruction whenever appropriate. (There is a strong positive relationship between content covered and student achievement. Monitoring can alert teachers to situations where they can profitably pick up the instructional pace and thus cover more material.)

MONITORING SEATWORK

Research comparing the behavior of effective teachers (i.e., those whose students achieve highly or higher than would be expected given background variable) with that of less effective teachers has clearly revealed the importance of monitoring the class during seatwork periods. Such monitoring involves teachers moving around the classroom, being aware of how well or poorly students are progressing with their assignments, and working with students one-to-one as needed. The most effective teachers:

- Have systematic procedures for supervising and encouraging students while they work.
- Initiate more interactions with students during seatwork periods, rather than waiting for students to ask for help
- Have more substantive interactions with students during seatwork monitoring, stay task-oriented, and work through problems with students
- Give extra time and attention to students they believe need extra help
- Stress careful and consistent checking of assignments and require that these be turned in

MONITORING HOMEWORK

The assignment of homework, like many educational practices, can be beneficial, neutral, or detrimental depending upon he nature and context of the homework tasks. The use of homework assignments bears a significant and positive relationship to achievement when the homework is carefully monitored, as well as serving the function of increasing students' learning time. Homework confers the most beneficial results when assignments are:

- Closely tied to the subject matter currently being studied in the classroom
- Given frequently as a means of extending student practice time with new material
- Appropriate to the ability and maturity levels of students
- Clearly understood by students and parents
- Monitored by parents; i.e., when parents are aware of what needs to be done and encourage homework completion
- Quickly checked and returned to students
- Graded and commented on

The research also indicates that homework which meets these criteria is positively related to student attitudes. Students may say they don't like homework, but research shows that those who are assigned regular homework have more positive attitudes toward school, toward the particular subject areas in which homework is assigned, and toward homework itself, than students who have little or no homework.

the research also indicates that homework which meets these criteria is positively related to

student attitudes. Students may say they don't like homework, but research shows that those who are assigned regular homework have more positive attitudes toward school, toward the particular subject areas in which homework is assigned, and toward homework itself, than students who have little or no homework.

MONITORING AS A PART OF CLASSROOM REVIEWS

Research has established a link between integrating monitoring methods into periodic classroom reviews and the later achievement of students involved in the review sessions. Daily, weekly, and monthly reviews can all enhance the learning of new material and, if they incorporate questioning and other learning probes, can call attention to areas where reteaching is needed.

The effectiveness of using review sessions to monitor student learning is clearly revealed in the research on the effects of teacher training: teachers trained in methods for conducting periodic classroom reviews which include the use of learning probes had students whose achievement was higher than it was before the teachers had been trained and higher than the achievement of students of untrained teachers. In addition, including monitoring activities in periodic reviews is a built-in feature of such successful programs as Distar and the Exemplary Center for Reading instruction (ECRI) system, as well as being a function carried out by the effective teachers in several comparative observational studies.

CLASSROOM TESTING

Those who study assessment and evaluation techniques are quick to point out that the role of standardized testing has received considerably more research attention than have classroom testing and other classroom-level assessment methods. The existing research does indicate, however, that well-designed classroom testing programs bear a positive relationship to later student achievement. Beneficial effects are noted when tests are:

- Administered regularly and frequently
- An integral part of the instructional approach (i.e., well-aligned with the material being taught)
- Collected, scored, recorded and returned to students promptly so that they can correct errors of understanding before these become ingrained

When attitudes toward testing are studied, students who are tested frequently and given feedback are found to have positive attitudes toward tests. They are generally found to regard tests as facilitating learning and studying, and as providing effective feedback--an outcome which has surprised some researchers, who had anticipated finding more negative student attitudes toward testing.

REVIEWING STUDENT PERFORMANCE DATA

While it is beyond the scope of this paper to describe the various systems teachers can use for recording and interpreting student performance data, it is worthwhile to note the importance of having and using such a system. Research comparing effective and ineffective teachers cites the existence and use of a systematic procedure for keeping and interpreting data on student performance as a notable difference between these groups.

MONITORING METHODS USED IN COMBINATION

Research findings on the discrete effects of various classroom monitoring methods comprise

only part of the story of applying classroom monitoring techniques. Research also indicates that using these methods in combination is superior to using only one or two of them. One researcher identifies five of the six monitoring methods above in his list of effective teaching behaviors. Another cites all of them as important components of a student accountability system. And in the comparative research on effective and ineffective teachers, the effective teachers were found to have implemented all or most of these monitoring functions in their classrooms.

COMMON ELEMENTS ACROSS MONITORING METHODS

Looking at the range of research on monitoring student learning, several attributes of effective monitoring are cited repeatedly across the different investigations:

- SETTING HIGH STANDARDS. When students' work is monitored in relation to high standards, student effort and achievement increase. Researchers caution, however, that standards must not be set so high that students perceive them as unattainable; if they do, effort and achievement decrease. The definition of "high standards" differs across studies, but generally, researchers indicate that students should be able to experience a high degree of success (on assignments, during classroom questioning, etc.) while continually being challenged with new and more complex material.
- HOLDING STUDENTS ACCOUNTABLE FOR THEIR WORK. Establishing expectations and guidelines for students' seatwork, homework, and other functions and following through with rewards/sanctions facilitates learning and enhances achievement.
- FREQUENCY AND REGULARITY. Whether the topic is teacher monitoring of seatwork, administration of tests, checking homework, or conducting reviews, researchers cite frequency and regularity in carrying out monitoring activities as a major reason they are effective.
- CLARITY. Clarity about expectations, formats, and other aspects of direction-giving bears a positive relationship to the achievement of the students doing the homework, participating in the classroom questioning session, etc.
- COLLECTING, SCORING, AND RECORDING RESULTS OF CLASSWORK, HOMEWORK, TESTS, AND SO ON. These activities are positively related to achievement, because they produce useful information to teachers and students and because they communicate to students that teachers are serious about effort and completion of assignments.
- FEEDBACK. Providing feedback to students lets them know how they are doing and helps them to correct errors of understanding and fill in gaps in knowledge. Some researchers focus on the ways in which feedback is provided, pointing out that students who are having learning difficulties require support, encouragement, and attention to their success if the feedback is to foster achievement of learning goals.

TEACHERS' SKILLS IN MONITORING STUDENT LEARNING

Given the strong connection between teachers' monitoring of students' learning progress and those students' academic performance, it would be ideal if teachers received thorough training in monitoring and were highly skilled in classroom monitoring practices. Unfortunately, this is not the case. The research on classroom-level monitoring and assessment reveals that:

- While standardized achievement test results are the main focus of assessment/evaluation efforts, nearly all important decisions about student placement, instructional pacing and so on are made on the basis of teachers' ongoing classroom monitoring.

- Many teachers do not: assign homework frequently or regularly, record completion assignments, monitor seatwork and check on students' progress, or conduct the kind of questioning that helps to monitor learning.
- Teachers do not receive adequate pre-service training in conducting formal or informal assessments.
- Administrative support for and inservice training in the skills associated with assessment and monitoring are extremely inadequate.
- Many teachers are aware that their monitoring skills are inadequate and desire training to expand their capabilities; many others are unaware of the importance of close monitoring of student progress and of their own need for skill development in this area.

The research on teachers' decision-making processes confirms this lack of monitoring on the part of many teachers. According to this research, a great many teachers are reluctant to make changes in the instructional strategy or pacing of lessons once these are planned, even when instruction and learning are progressing poorly. To a considerable degree, this improves with experience. Experienced teachers are found to vary teaching strategies in response to student performance cues much more than do novices. Still, monitoring/assessment skills remain an area of inadequate preparation for many teachers.

EFFECTIVE MONITORING PRACTICES

Since there are so many methods of monitoring student learning, descriptions of only a few will be given here. These are offered as examples of approaches used by successful teachers.

Using learning probes is the subject of the following question-and-answer exchange with practitioners (Excerpted from EDUCATIONAL PSYCHOLOGY: THEORY INTO PRACTICE by Robert E. Slavin. Englewood Cliffs, NJ: Prentice-Hall, 1986)

How do you monitor students' comprehension and work during a lesson? Teachers say they monitor students by:

- Asking them to interpret or summarize material presented to them in the lesson
- Thinking about the questions that students are asking and noting what parts of the lesson don't seem to be understood
- Asking questions from various levels of Bloom's taxonomy of learning objectives
- Asking students to act things out or draw them
- Walking around the class and checking worksheets, calling attention to errors and noting good work being done
- having students do quick problems on individual chalkboards
- encouraging children to listen to each other by summarizing comments of others and calling on children who don't seem to be listening

In the following paragraphs, a researcher reports on the differences between the monitoring behaviors of effective and less effective junior high school English and mathematics teachers. (Excerpted from STUDENT **ACCOUNTABILITY FOR WRITTEN WORK IN JUNIOR HIGH SCHOOL** CLASSES by Murray E. Worshan. Austin, TX: Research and Development Center for Teacher Education, 1981. (ED 203 387))

Both effective English and math teachers were extremely consistent in efficient monitoring techniques. They did more than just circulate among students during seatwork periods. these

teachers were systematic in noting individual students while moving or looking around the classroom, and they addressed individuals frequently, usually privately, to keep students accountable and on-task. These teachers were concerned that students work steadily on classwork as well as on tests, and their careful monitoring enabled them to address students immediately who were not working as expected. The nature and process of effective monitoring--of both behavior and academic work-- appeared to be highly salient in both math and English classes to keeping students on-task and responsible for their work.

More effective math and English teachers were extremely consistent in checking assignments regularly. Homework was assigned virtually every day, and a daily routine in most teachers' classes involved students' exchanging papers and checking them in class as directed by the teacher. Usually the more effective teachers had students sign papers they graded, and at least one effective math teacher cautioned her students to grade papers with care.

Two key actions on the part of the more effective teachers in both math and English classes followed the checking period. First, these teachers asked students for their grades and recorded them immediately as the class watched and listened. Next, these teachers always took up papers to check themselves. They were thus holding students accountable for doing their work, for doing it well, and for checking it accurately. A further step noted in classes of several more effective math teachers was their individually questioning students who made low grades or zeros. These teachers determined whether students were having difficulty and needed extra help or were not doing their assignments at all. These teachers told students that they noted such grades resulting from lack of effort in their garde book.

When checking daily assignments in class, more effective math and English teachers provided feedback to students as to content as well as a review or further explanation of concepts and processes. By explaining how to figure grades and having grades announced for recording purposes, teachers enabled students to hear how they stood in relation to the rest of the class and gave evidence of the fact that the teachers took seriously the work they assigned. By taking up, checking, and returning papers, teachers provided additional feedback by means of written comments and possible modification on student grading.

The advisability of using these effective monitoring practices is further underscored in the following guidelines concerning seat work and homework. (Excerpted from "Teacher behavior and Student Achievement," by Jere E. Brophy and Thomas L. Good. In Handbook of Research on Teaching (Third Ed.), edited by Merlin C. Wittrock. New York: Macmillan Publishing Co., 1985)

. . .seat work (and homework) assignments provide needed practice and application opportunities. Ideally, such assignments will be varied and interesting enough to motivate student engagement, new or challenging enough to constitute meaningful learning experiences rather than pointless busywork, and yet easy enough to allow success with reasonable effort.

. . . Student success rates, and the effectiveness of seat work assignments generally, are enhanced when teachers explain the work and go over practice examples with the students before releasing them to work independently. Furthermore, once the students are released to work independently, the work goes more smoothly if the teacher (or an aide) circulate to monitor progress and provide help when needed. If the work has been well chosen and well explained, most of these "Helping" interactions will be brief, and at any given time, most students will be progressing smoothly through the assignment rather than waiting for help.

Students should know what work they are accountable for, how to get help when they need it, and what to do when they finish. Performance should be monitored for completion and accuracy, and students should receive timely and specific feedback. When the whole class or group has the same assignment, review of the assignment can be part of the next day's lesson. Other assignments will require more individualized feedback. Where performance is poor, teachers should provide not only feedback but reteaching and follow-up assignments designed to insure that the material is mastered.

Teacher competence in assessing students' skill levels and monitoring their learning progress is essential for effective instruction to take place. "Imagine," writes researcher Robert Slavin," an archer who shoots an arrow at a target but never finds out how close to the bull's-eye the arrows fall. The archer wouldn't be very accurate to begin with, and would certainly never improve in accuracy. Similarly, effective teaching requires that teachers be constantly aware of the effects of their instruction."

Improvements in preservice and inservice training in assessment and monitoring skills can both increase teachers' awareness of these effects and help them to make instructional changes as called for by the information they collect. This is vital for, as noted by writers Howell and McCollum-Gahley, "the most important part of continuous monitoring is not taking data, but making decisions."

KEY REFERENCES

Brophy, J.E. "Teacher Behavior and Its Effects." JOURNAL OF EDUCATIONAL LEADERSHIP 71 (1979): 733-750.

> Reviews the research on the relationship between teacher behaviors and student achievement. Teaching methods shown to promote achievement include: (1) direct instruction, (2) brisk instructional pacing, (3) frequent feedback and reinforcement, and (4) high expectations. Includes references to monitoring as an essential feature of effective teacher.

_____, and T. L. Good. "Teacher Behavior and Student Achievement." In HANDBOOK OF RESEARCH ON TEACHING (Third Ed.), edited by M.C. Wittrock. New York: Macmillan Publishing, 1985.

> Summarizes research on classroom behaviors which are positively related to student achievement.

Butler, J.A. CLOSE-UP: HOMEWORK. Portland, OR: Northwest Regional Educational Laboratory, 1986.

> Reviews research on the effects of assigning and grading homework on student achievement. Also provides examples of district homework policies.

Edmonds, R. R. "Effective Schools for the Urban Poor." EDUCATIONAL LEADERSHIP 37 (1979): 15-27.

> Reviews studies conduced with inner-city children from low socioeconomic backgrounds. Characteristics of schools which are effective in educating these children include: (1) strong leadership; (2) high expectations; (3) orderly

environment; (4) emphasis on basic skills; (5) using school resources to support priority goals; and (6) frequent in-class and schoolwide monitoring of student progress.

Fisher, C.W.; C.D. Berliner; N. N. Filby; R. Marliave; L.S. Cahen; and M. M. Dishaw. "Teaching Behaviors, Academic Learning Time, and Student Achievement: An Overview." JOURNAL OF CLASSROOM INTERACTION 17(1981): 2-15.

Investigates the relationship of teaching behaviors to academic learning time (the amount of time a student spends in an academic task that he/she can perform with high success) and to student achievement. Monitoring is identified as a function positively related to both ALT and achievement.

Fuchs, L, and D. Fuchs. "Effects of Systematic Formative Evaluation: A Meta-analysis." EXCEPTIONAL CHILDREN 53(1986): 199-208.

Reports findings from a meta-analysis on the effects of close monitoring of the learning of mildly handicapped students. Those whose programs were systematically monitored and developed formatively achieved an average of .7 standard deviation units higher than those taught without close monitoring or programs which are developed formatively.

Good, T. L., and D.A. Grouws. "The Missouri Mathematics Effectiveness Project: An Experimental Study in Fourth-Grade Classrooms." JOURNAL OF EDUCATIONAL PSYCHOLOGY 71(1979): 355-362.

Reports the results of a study in which 40 teachers received instruction in effective teaching practices, then implemented these with their students. Trained teachers' students out performed control teachers' students. Monitoring (daily review, checking daily seatwork, checking homework, weekly and monthly reviews) was a major feature of the program in which teachers received training.

Griswold, P.A.; K.J. Cotton, and J.B. Hansen. EFFECTIVE COMPENSATORY EDUCATION SOURCEBOOK, VOLUME I: A REVIEW OF EFFECTIVE EDUCATIONAL PRACTICES. Washington, DC: U.S. Department of Education, 1986. (ED 276 787).

Reviews research on effective educational practices and gives examples of the implementation of these in Chapter 1 programs. "Closely monitored student progress" is one of 13 attributes identified as enhancing student achievement.

Howell, K.W. and J. McCollum-Gahley. "Monitoring Instruction." Teaching Exceptional Children 18(1986): 47-49.

Describes a research-based process for collecting data on student achievement and using it to monitor students' progress and make decisions about their instruction. Also cites research indicating that special education students whose progress is monitored in this way have higher achievement than those who are not monitored using such a process.

Hummel-Rossi, B. "Aptitudes as Predictors of Achievement Moderated by Teacher Effect." In NEW DIRECTIONS FOR TESTING AND MEASUREMENT: MEASURING HUMAN ABILITIES. San Francisco, CA: Jossey-Bass, 1981.

Investigates the relationship between aptitude and achievement and between teacher behaviors and achievement for 219 eight graders and 167 of these same students as tenth graders. One major finding is that student performance improves with close monitoring of learning progress.

Medley, D. M. TEACHER COMPETENCE AND TEACHER EFFECTIVENESS: A REVIEW OF PROCESS-PRODUCT RESEARCH. Washington, D.C.: American Association of Colleges for Teacher Education, 1977. (ED 143 629).

This report analyzes and synthesizes the results of nearly 300 studies. Over 600 process-product relationships are displayed in a series of tables and then synthesized into a series of statements about effective teaching. Monitoring of student understanding/learning during classroom activities was found to be an important component of effective teaching.

Natriello, G. "The Impact of Evaluation Processes on Students." Educational Psychologist 22(1987): 155- 175.

Reviews research on the effects of different aspects of the evaluations process on student outcomes. The aspects are: (1) establishing the purposes for evaluating students; (2) assigning tasks; (3) setting performance criteria; (4) setting student performance standards; (5) sampling information on student performance; (6) appraising student performance; (7) providing feedback on student performance; and (8) monitoring the outcome of the evaluation of students.

Peckham, P.D., and M.D. Roe. "The Effects of Frequent Testing." Journal of Research and Developmental Education 10(1977): 40-50.

Examines the research on the effects of frequent formative testing on student achievement and attitudes. Frequent testing has a positive effect on student attitudes. Findings are inconclusive regarding effects on achievement; however, positive achievement effects are noted when frequent testing is an integral part of the instructional approach used (e.g., Bloom's mastery learning).

Peters, E., and J. Lloyd. "Effective Instruction: Critical Components of Teaching." TEACHING EXCEPTIONAL CHILDREN 18(1986).

Reviews research-based instructional techniques that promote learning among regular and handicapped students. Identifies a "general pattern of effective instruction which include (a) teachers monitoring instruction, (b) teachers delivering instruction, and (c) teachers managing students.

Rosenshine, B. "Teaching Functions in Instructional Programs." The Elementary School Journal 83(1983): 335-351.

Cites research on effective teaching practices with a special focus on the common ingredients found in successful inservice training programs. Six vital instructional functions are described in detail: (1) review/checking previous days work; (2) presenting new content/skills; (3) initial student practice; (4) feedback and correctives; (5) student independent practice; and (6) weekly and monthly reviews.

Slavin, R.E. "The Lesson" Chapter 8 in EDUCATIONAL PSYCHOLOGY: Theory into Practice. Englewood Cliffs, NJ: Prentice-Hall, 1986.

Provides a discussion of the component parts of classroom lessons, including citing research in support of various monitoring activities.

Tobin, K. "Validating Teacher Performance Measures against Student Engagement and Achievement in Middle School Science." SCIENCE EDUCATION 70(1986: 539- 547.

Tests the validity of the Teacher Performance Assessment Instruments (TPAI). Statistically significant correlations were found between various teacher behaviors and both student engagement rate and students' achievement. Several of the most strongly predictive TPAI indicators relate to monitoring and assessment.

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

Reviews 15 studies on the effects of homework on achievement and concludes that: (1) regular homework confers greater achievement benefits than little or no homework, (2) the benefits are even greater if the homework is commented on and\or graded, and (3) programs in which parents are taught how to encourage their children and monitor their progress show achievement benefits.

Ward, W.D., and J.E. Jungbluth. "Sex Differences in Classroom Achievement as a Function of Participation in Monitoring and Reinforcement." THE JOURNAL OF PSYCHOLOGY 106(1980): 255-258.

Compares the effects of a self-monitoring and selfreinforcement structure with those produced by an
external monitoring and reinforcement structure and with the effects of one in which there was no monitoring and rewards were non contingent. One finding was that students who experienced daily monitoring (provided by self or others) outperformed those who were not monitored.

Weber, A. INNER-CITY CHILDREN CAN BE TAUGHT TO READ: FOUR SUCCESSFUL SCHOOLS. Occasional Paper No. 18. Washington, D.C.: Council for Basic Education, 1971.

Reports the results of an observational study in which four urban elementary schools were investigated to determine the reasons for their success in teaching reading skills. Identifies close classroom evaluation of student progress among the factors leading to success.

Wilson, R. "Direct Observation of Academic Learning Time." TEACHING EXCEPTIONAL CHILDREN (1987): 13-17.

Cites research findings on the positive effects of academic learning time (ALT) and offers a system whereby teachers or other observers can keep track of on-task behavior and student success rate.

Worsham, M.E. STUDENT ACCOUNTABILITY FOR WRITTEN WORK IN JUNIOR HIGH SCHOOL CLASSES. Austin TX: Research and Development Center for Teacher Education, 1981. (ED 203 387).

Investigates the relationships between certain teaching behaviors and the achievement of junior high math students. Findings are compared with those emerging from an earlier study in junior high English classes.

_____, and C.M. Evertson. SYSTEMS OF STUDENT ACCOUNTABILITY FOR WRITTEN WORK IN JUNIOR HIGH SCHOOL ENGLISH CLASSES. R&D Report No. 6105. Austin, TX: Research and Development Center for Teacher Education, 1980. (ED 196 008).

Investigates the relationship between accountability systems and student achievement. Seven teachers of high-achieving students were compared with seven teachers of lower-achieving students in terms of their methods of assigning and holding students responsible for written work.

OTHER REFERENCES

Alexander, D.L.; K.J. Cotton; M.M. Griswold; and G.D. Estes. EFFECTIVE COMPENSATORY EDUCATION SOURCEBOOK, VOLUME III: PROJECT PROFILES. Portland, OR: Northwest Regional Educational Laboratory, 1987.

Provides profile descriptions of the 130 programs selected for recognition in 1986 through the Secretary's Initiative to Improve Chapter 1 projects.

Beady, C.H., Jr.; R.E. Slavin; and G.M. Fennessey. "Alternative Student Evaluation Structures and a Focused Schedule of Instruction in an Inner-City Junior High School." JOURNAL OF EDUCATIONAL PSYCHOLOGY 73(1981): 518-523.

Investigates the effects of a direct instruction model (focused instruction) and of two evaluation approaches on student achievement. Regardless of evaluation method, the focused instruction groups performed well and outperformed controls.

Bush, M.M. "The Complexity of Institutionalizing a Program: Acquisition of Training, Observing and Computing Capability." JOURNAL OF CLASSROOM INTERACTION 20(1984): 6-15

Describes the ALT (academic learning time) teacher training model used by the District of Columbia Public Schools. The model includes workshops in: (1) classroom organization and management; (2) behavior management; (3) interactive instruction; (4) monitoring and feedback; and (5) improving interaction.

Chacko, T. "Student Ratings of Instruction: A Function of Grading Standards." EDUCATIONAL RESEARCH QUARTERLY 8(1983): 19-25.

Investigates the relationship between teachers issuing grades to students and those students' attitudes toward teachers. Graded students' evaluations of their teachers dropped after grading; those of control students did not.

Evertson, C.M.; C.W. Anderson; L.M. Anderson; and J.E. Brophy. "Relationships Between Classroom Behaviors and Student Outcomes in Junior High Mathematics and English Classes." AMERICAN EDUCATIONAL RESEARCH JOURNAL 17(1980): 43-60.

Reports results of an observational study involving 39 English and 29 mathematics teachers and conducted to determine teacher behavior-student outcome relationships. Of the many behaviors shown to promote student achievement, several relating to student monitoring are cited.

Griswold, P.A.; K.J. Cotton; and J.B. Hansen. Effective compensatory Education Sourcebook Volume II: Project Profiles. Portland, OR: Northwest Regional Educational Laboratory, 1986.

Provides profile descriptions of the 116 programs selected for recognition in 1985 through the Secretary's Initiative to Improve Chapter 1 projects.

Gronlund, N. E. CONSTRUCTING ACHIEVEMENT TESTS. Englewood Cliffs, NJ: Prentice-Hall, 1982.

Discusses issues in planning and developing tests and provides guidelines for writing test items and designing/using essay tests.

Guerin, G.R. and A.S. Maier. INFORMAL ASSESSMENT IN EDUCATION. Palo Alto, CA: Mayfield Publishing Co., 1983.

Focuses on assessment strategies that can be used to organize and interpret information gathered through daily observation and interaction with students.

Linn, R.L. "Testing and Instruction: Links and Distinctions." Journal of Educational Measurement 20(1983): 179-189.

Discusses actual and potential relationships between testing and instruction. The purposes and uses of both classroom tests and standardized tests are outlined.

Medley, D.M. "The Effectiveness of Teachers." In P.L. Peterson and H.J. Walberg (eds.). Research on Teaching: Concepts, Findings and implications. Berkeley, CA: McCutchan Publishing Company, 1979.

Discusses the history, current activities and future of research on effective teaching. Describes the processes and outcomes of conducting a large-scale review of research on effective teaching.

Purkey, S.C. and M.S. Smith. "Effective Schools: A Review." ELEMENTARY SCHOOL JOURNAL 83(1983: 427-452.

Provides an extensive review and critique of the literature on school effectiveness. Organizationstructure variables and process characteristics of school culture are discussed. Identifies student progress monitoring as an important component of school effectiveness.

Rucher, D. and D. Feldman. THE EFFECTS OF TWO STUDENT MONITORING PROCEDURES AND CONTINGENCY REINFORCEMENT ON THREE TASK-ATTENDING BEHAVIORS. Paper presented at the Annual International Convention of the Council for Exceptional Children, 1983. (ED 232 779).

Investigates different monitoring approaches. More concerned with monitoring behavior than monitoring learning, but offers some good insights on the monitoring

role and who performs it.

Shavelson, R.J. "Review of Research on Teachers' Pedagogical Judgments, Plans and Decisions." THE ELEMENTARY SCHOOL JOURNAL 83(1983): 392-413.

Reviews research on the processes followed by teachers in determining grouping plans, instructional strategies, pacing of lessons and other classroom matters.

Stewart, L.G., and M.A. White. "Teacher comments, Letter Grades and Student Performance: What Do We Really Know?" JOURNAL OF EDUCATIONAL PSYCHOLOGY 68(1976: 489-500.

Seeks to replicate a study which found written teacher comments on student papers effective in raising achievement in math and spelling. No relationship was found between the provision of comments and student achievement.

Stiggins, R.J. REVITALIZING CLASSROOM ASSESSMENT: THE HIGHEST INSTRUCTIONAL PRIORITY. PORTLAND, OR: NORTHWEST REGIONAL EDUCATIONAL LABORATORY, 1987.

Presents findings documenting teachers' need for improved classroom assessment competencies and offers suggestions for how this need might be met.

_____. "Improving Assessment Where It Means the Most: In the Classroom." EDUCATIONAL LEADERSHIP 43(1985): 69-73.

Examines the research on classroom assessment and offers recommendations for teacher training and administrator support regarding assessment.

_____; N. Conklin; and N.J. Bridgeford. Insights into Classroom Assessment. Portland, OR: Northwest Regional Educational Laboratory, 1986.

Reviews research on classroom assessment and draws implications for future research and for teacher training in assessment techniques.

Walter, L.J. "A Synthesis of Research Findings on Teacher Planning and Decision Making." IN USING RESEARCH TO IMPROVE TEACHER EDUCATION. Teacher Education Monograph No. 1, edited by R.L. Egbert and M.M. Kluender. The Nebraska Consortium, 1984. (ED 246 025)

Reviews research on the approaches teachers use to plan instruction and make changes and other decisions. Cites several findings, including that teachers do not generally plan activities based on learning objectives, and that they are reluctant to make changes in lessons once these are planned even when instruction and learning are progressing poorly.

Williams, R.G.; M.J. Pollack; and N.A. Ferguson. "Differential Effects of Two Grading Systems on Student Performance." JOURNAL OF EDUCATIONAL PSYCHOLOGY 67(1975): 253-258.

Investigates the relative effects of norm-referenced and criterion-referenced testing on the achievement and attitudes of students.

This publication is based on work sponsored wholly, or in part, by the Office of Educational Research and Improvement (OERI), U.S. Department of Education, under Contract Number 400-86-0006. The content of this publication does not necessarily reflect the views of OERI, the Department, or any other agency of the U.S. Government.

May 1988