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## RECENT CLASSROOM RESEARCH AND ITS IMPLICATIONS FOR TEACHING\*

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In the early days of classroom research, a great number of studies were conducted but unfortunately yielded either insignificant or contradictory results. As Medley (1979) puts it, "to borrow a phrase Charles Silberman once used in a similar context, the teacher educator who examines the research is likely to conclude that there is less there than meets the eye" (p.16). But in the past twenty years, and especially the past ten years, the research on teaching has been fruitful and can be of great benefit to teachers and teacher educators.

This research generally follows a process-product framework where teacher behaviours and classroom factors (process) are identified which most influence student academic achievement (product). This research is described in many sources, including Peterson and Walberg's *Research on Teaching* (1978) and Berliner's chapter "Instructional Variables" (1982).

Within this area of research, Berliner and Rosenshine identified a cluster of teacher and classroom variables that they found to be consistently related to student academic achievement and which they termed direct instructional variables (Berliner and Rosenshine, 1977; Rosenshine and Berliner, 1978; Berliner, 1979). Most of these variables pertain to the academic or cognitive side of education, such as the amount of time teachers spend on academic subject matter or the provision of academic feedback, but a few variables pertain to the emotional or affective side, particularly interpersonal relations.

A central study that contributed to the direct instruction model was the Beginning Teacher Evaluation Study (BTES) under the direction of David Berliner. This paper will focus on the major findings of this study and its implications for teaching in Western Australia.

\* This paper was written as a result of professional leave taken with Dr. David Berliner of the University of Arizona, U.S.A.

The title of the study is actually a misnomer as the purpose of the study changed to include teachers of all levels of experience. The main purpose of the study was to identify instructional variables that predicted student academic achievement. Its focus was on reading and mathematics at the primary level, though the findings have implications that go beyond this focus.

BTES is one of the largest studies conducted in the United States in the area of classroom research. It is large in terms of funding, numbers of teachers involved, and duration. It had several stages but I will describe only the main stage and one finding from an earlier stage (see the history section in *Time to Learn*, 1980, for a description of all stages of the study).

In the main stage, reading and mathematics in Years 2 and 5 were studied. There were 25 Year 2 teachers and 21 Year 5 teachers. The sample of students was comprised of six students (3 boys and 3 girls) in each class. Each student had scored between the thirtieth and sixtieth percentile on standardized tests of both reading and mathematics.

Teachers kept logs on time spent on specific content areas within the two broad content areas of mathematics and reading. Observers also coded teacher and student behaviours, using a coding system. Students were administered achievement tests and attitude scales. (A full description of the methodology is found in Chapter 1 of *Time to Learn*.)

The findings can be broadly grouped into two categories; the first is time and the second is instructional processes and classroom environment. Three kinds of time were predictors of student academic achievement: allocated time, engaged time and academic learning time. Allocated time is the amount of time devoted to a content area while engaged time is the amount of time the student actually attends to (is engaged with) the content area. For both of these measures, the greater the amount of time, the greater the achievement.

BTES also revealed enormous variations in these two kinds of time between classrooms. For example, with regard to allocated time, in Year 2, minutes **per day** allocated to reading ranged from 47 in one class (about three-quarters of an hour) to 118 in another (almost two hours). The range for mathematics was 16 minutes per day to 51 minutes per day. In Year 5, the range in minutes **per day** for creative writing was 0 to 573

(almost ten hours) and for fractions, was 0 to 399 (about six and a half hours). With regard to engaged time, the percentage of time students were engaged in Year 5 mathematics classes ranged from 50 per cent in one class to 89 per cent in another. (These data are summarized in Berliner, 1982). There was, then, a great deal of variation among classes in time allocated to subject matter and in student attention to that subject matter.

Academic learning time refers to the amount of time a student is engaged in a task that is not difficult (student success rate of approximately 80 per cent or higher) and is congruent with outcome measures (what is taught relates to what is tested). Academic learning time is a predictor of student academic achievement. The finding on success rate is qualified in that older students of middle or high ability seem to need more challenging tasks than younger students or students of any age at a low ability level. However, regardless of age or ability level, success rates that are too low are negatively correlated with academic achievement. With regard to content-outcome congruence, Freeman *et al* (1980) found that the congruence between three national US textbooks and three national US achievements tests in mathematics ranged from 47 per cent to a high of only 71 per cent. What was taught and what was tested did not match well.

The second category of BTES findings is instructional processes and classroom environment. The following instructional process variables were positively and significantly correlated with academic achievement. Teachers were effective who were able to diagnose accurately their students' level of skill, who prescribed appropriate tasks, who interacted with students with regard to academic content (e.g., discussing and valuing academic goals and providing academic feedback), who discussed the structure of the lesson with their students and who gave clear directions to their students.

A variable that was negatively correlated with student academic achievement was the amount of task engagement feedback given by teachers. Task engagement feedback is information given to the student on whether his or her behaviour is acceptable or unacceptable. Usually, it is a reminder to the student to get back to work. Such feedback, then, is a predictor of low academic achievement. Also, the study showed that students were often off task because the material was too difficult.

With regard to classroom environment, an effective classroom environment was characterized by student responsibility for academic work and by student co-operation on academic tasks. "In classes where students took responsibility for their class work and belongings and where students helped each other, shared materials, and worked together, achievement was generally higher" (p.22, *Time to Learn*, 1980).

In an earlier stage of BTES study, there was another important finding with regard to classroom environment. Berliner and Tikunoff (1976) found that a classroom environment characterized as warm, democratic and convivial was significantly related to student academic achievement. Teachers who believe that authoritarian and stern atmospheres are best for academic achievement should be made aware of this finding. This finding does not suggest that teachers should avoid an academic focus or orientation. Such an orientation was also a predictor of academic achievement. What is suggested is that to promote academic achievement, teachers should be academically oriented (making it known to students that academic goals are important, discussing academic content, etc.) and should provide a classroom atmosphere that is warm, caring and democratic.

There are several implications of these findings for teaching in Western Australia. For teachers and those training to be teachers to be aware of research findings and to be able to discuss their implications for education in Western Australia is highly important. One may raise the caution that one should be careful in applying these findings because of cultural differences between the U.S. and Australia. This caution is relevant and further studies in Australia are needed. Also, this caution actually goes beyond cultural differences; one should be careful in the application of all research findings. In an excellent article, Fenstermacher (*Time to Learn*, 1980) says that one cannot make a rule of practice based on research findings. Rather, the findings usually suggest a framework that teachers may want to consider in light of their own experience and wisdom, or common sense. Then, changes in practice can be put into effect. Research thus describes and suggests, but rarely on its own prescribes. Administrators particularly need to take note of this point. Too often a new method or model based on research findings becomes the rule rather than a framework for teachers to alter and implement.

With this caution in mind, teachers can consider these findings in terms of creating an instructional environment that maximizes their students' academic achievements. With regard to the first category of

findings, teachers can take their own measures of allocated and engaged time. A measure of allocated time will inform the teacher of the relative emphasis given to subject areas, while a measure of engaged time will indicate how much of the allocated time is being used productively. Berliner notes that engaged time is often reduced by inefficiency, such as long transition time between activities and students waiting for a teacher to answer their questions. Large classes lead to such wasted time. Teachers can also check the success rate of their tasks. If the success rate is too low, achievement is reduced. Teachers should also keep in mind the variations in success rate, over age and ability levels. Finally, teachers can examine their tests to determine whether the tests relate to the content they are teaching.

With regard to the second category of findings, teachers can ask to what extent they are prescribing tasks based on their diagnosis of level of student skill. They can ask to what extent they are interacting with their students about the purpose and structure of the lesson and about the subject matter itself. Teachers can also determine whether the feedback they are providing students is academic feedback or task engagement feedback (feedback related to the content or to the students' behaviour). Obviously, a class that does not want to learn will result in more teacher task engagement behaviour. But the BTES results point out that often students are disruptive or off task because the material is too difficult (and perhaps also uninteresting). A concentration on appropriate and interesting tasks can reduce discipline or attention problems.

There are two important implications within this second category with regard to affective outcomes. First, academic achievement is promoted when classroom environments are warm, democratic and convivial. Teachers and administrators are too often authoritarian. Positive adult-student relations are not encouraged, while unquestioning obedience to the rule is. It is vital that classroom and school atmospheres be established where there is an academic (learning) orientation and an emphasis on caring. The two are complementary, not contradictory.

The second affective implication is that academic achievement is promoted when students are responsible for their own work and there is student co-operation on tasks. Students are often given too little responsibility where there is an emphasis on external control rather than on inner control. Fostering of independence of thought and work habits is an important educational goal.

Teachers will have difficulty carrying out these suggestions in the affective area unless they have administrative support. For example, teachers may foster an atmosphere of caring and democracy in the classroom, but this atmosphere will be seriously constrained if administrators do not foster a similar atmosphere within the school and the education system generally.

Finally, there are other implications of this research in the areas of classroom management, educational policy and future research. With regard to classroom management, the results of the BTES study imply that teachers need to be good managers, in terms of managing learning as well as learners (see *Time to Learn*, 1980, pp.31-32; Berliner, 1980). With regard to educational policy, we in Western Australia must address the following questions: which educational goals do we include in the curriculum? how much time do we allocate to each goal? and, who makes the decision? With regard to future research, we would benefit from knowing the answers to such questions as: what is the time allocated to different content areas in Western Australia? what are student success rates? and, how would classes be judged in terms of their classroom atmosphere?

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