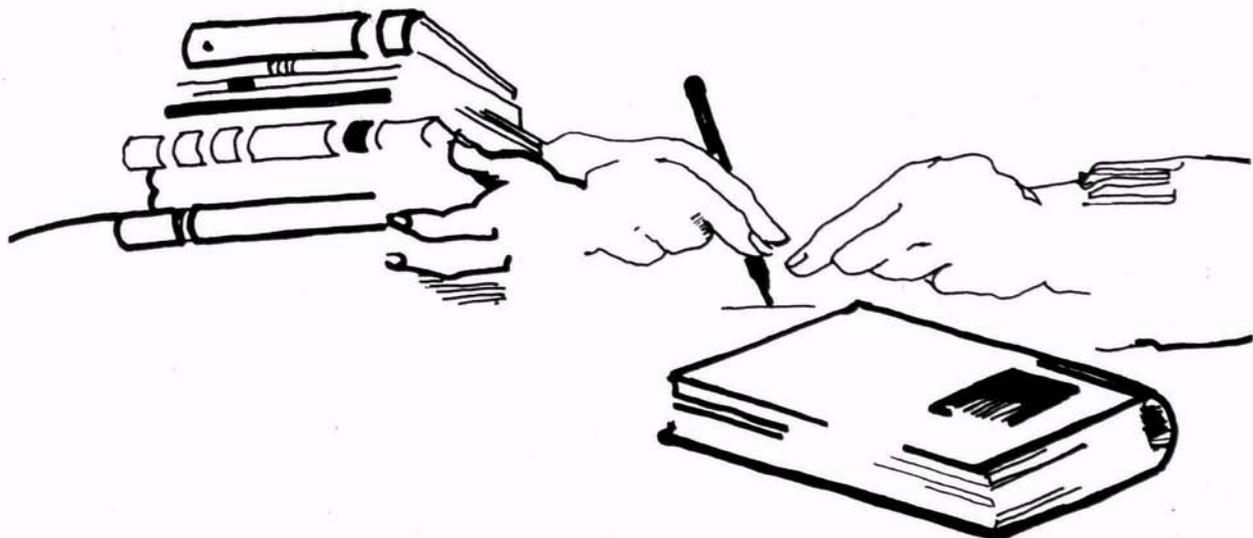


New Evidence for Old Truths

Marjorie Powell



A six-year study of how teachers affect learning of reading and mathematics provides research evidence to support some old truths.

There are many old truths about schools and teaching. There is also new research evidence to support some of them, evidence based on a study conducted over the past six years in California. Several hundred elementary teachers in many schools participated voluntarily in the study of teaching and learning of reading and mathematics.

The study, known as the Beginning Teacher Evaluation Study (BTES), was conducted by the California Commission for Teacher Preparation and Licensing and funded by the National Institute of Education. The purpose was to get information to improve teacher preparation in California, but the main findings are readily applicable to a variety of teaching situations.¹

Student Attention to Task

One not-so-surprising finding is that the greater the proportion of time that students are engaged in their work, the more they learn during a school year.²

To say it another way, students learn more if they pay attention to their work.

Students in the classes studied spent different proportions of their time actively engaged in their lessons. When they were supposed to be working, they actually were working, on the average, 75 percent of the time. Some students spent as little as 50 percent and others as much as 80 percent of their work time actually engaged in instructional tasks. Not only did individual student engagement rates differ, but so did the average rates for classes. Some teachers

¹ For summary reports, see: F. J. McDonald, *Beginning Teacher Evaluation Study, Phase II: Executive Summary*. Princeton, New Jersey: Educational Testing Service, 1976; and C. W. Fisher, D. C. Berliner, N. N. Filby, R. S. Marliave, L. S. Cahen, M. M. Dishaw and J. E. Moore. *Teaching and Learning in the Elementary Schools: A Summary of the Beginning Teacher Evaluation Study*. San Francisco: Technical Report VII-I, Beginning Teacher Evaluation Study, Far West Laboratory for Educational Research and Development, 1978.

² Fisher and others, *op. cit.*

were more successful than others in keeping students involved in their work.

Students spent a greater proportion of their time involved in their work in settings where they were interacting with the teacher or another adult. When they were supposed to be doing seatwork, they spent more time doing it when the teacher circulated, checking work, than when he/she remained in one place. They also used their seatwork time more productively when more of their groupwork time was spent in interaction with the teacher (presentations or questions and answers) than when it was used for other things.

The idea of student attention to work can provide an immediate measure of success. Teachers can see relatively easily which students pay attention in what types of instructional settings. They can see which of their own actions result in increased student attention to task, which instructional groupings result in especially attentive students, and what things distract students.

The catch is that it's very difficult for teachers, while teaching, to pay attention to the engagement of their students. Teachers are typically aware of whether certain students—those who are apt to disrupt the class—are paying attention, but they may not notice whether the quiet students are actively involved in their work. One teacher in the study didn't believe that a quiet student daydreamed most of the day until she watched a videotape and saw for herself.

With some concessions to the problems involved in watching and teaching at the same time, teachers can use the idea of student attention to task as an immediate indication of the effectiveness of lessons. A teacher might focus on just one or two students who aren't achieving at expected levels. Supervisors can help, or teachers can ask aides to observe during a particular lesson to see how well students are working.

Student Success Rate

Another important matter studied in the BTES was the rate of success students had with assigned tasks. With a high success rate, a student gets answers right most of the time. A low success rate means that he/she gets right answers only occasionally. Students learn more when they spend more time on tasks at which they have a high success rate.³ This is especially true of those who have fewer skills in the first place.

The rate of success is not inherent in the instructional task, but is a function of the relationship between the task and the student's skill level. The same task may be easy for one student and hard for another, or a task may be hard for a student at one time in the year but easy at another time.

Teachers differ in their skill in estimating whether a particular task will be easy or hard for an individual student. While most teachers who participated in the study were fairly accurate, a small number were quite inaccurate.

Once they recognize that students need to spend more time on tasks at which they have a high, rather than a moderate, success rate, teachers can learn to monitor each student's rate of success. It isn't difficult when the students are doing written work because the work is direct evidence of success. Oral work is harder, but it can be monitored too. For example, a teacher can select a few students and record pluses and minuses for right and wrong responses they make during oral work.

Instructional Time

Another finding is that, in general, the more time spent in reading (or mathematics) instruction, the more students learn of that subject. Variations in length of the school year or the school day cause some of the differences, but fewer periods of instruction are another cause. While some teachers reported that they taught reading and mathematics every day, others said they sometimes skipped a subject, usually math rather than reading.

There were also variations among classes in the amount of time during the day when students were supposed to be learning reading or math. Some teachers spent three times as much time teaching reading as did other teachers at the same grade levels.⁴

Before teachers automatically increase the amount of time devoted to reading or math, it is important that they think about the implications. Increasing the time allocated to reading or math probably would mean decreasing the time spent on other subjects.

An alternative is to use more effectively the time already devoted to a subject. That might be done by increasing the proportion of time in which students are actively engaged in their work, or in which they have a high rate of success. It might also be achieved by decreasing the time students spend in transition from one task to another, getting materials to do their work, or waiting for directions or help.

Content Coverage

Another truism confirmed by the BTES is that students tend to learn what they are taught and not to learn what they are not taught. Differences in stu-

³ M. Powell, "Difficulty Level of Student Assignment," *Practical Applications of Research* 1: March 1979.

⁴ M. Powell, "Time Allocations: Teachers Help Determine Curriculum," *Educational Horizons* 57:13-16; 1979.

dent learning during a school year can be explained partly by differences in content covered by teachers. For example, some teachers spend time teaching word problems in mathematics at grade two, but some do not. Even with the same instructional materials, teachers differ in the emphasis given to various topics. The research results show that when teachers "cover" a given set of skills, most students learn them.

To make sure that all students learn what they should, teachers have to keep track of what each one has studied. One way to simplify the task is to assign the same task to all students. But that is apt to result in lower success rates for some students, those for whom the common tasks are too difficult. And, faster learners may spend less time actively involved because they finish early and wait for another task.

Another approach is to assign individual student tasks, keeping extensive records of what skills have been mastered by each student. In this case, however, engagement rates are apt to be lower because when they work independently, students have relatively little interaction with the teacher. In other words, when assignments are individualized to provide work at the best success level, the teacher may be less able to keep students actively engaged in their learning tasks. This quandary illustrates the complexity of teaching.

Academic Focus

Another important factor found to be related to higher scores on reading and mathematics tests was the "academic focus" of some classrooms.⁵ In these classrooms teachers and students recognize the importance of learning as a major reason for their being in school. Learning is valued by the teacher, and that fact is communicated to students. The teacher holds students responsible for their work; students are expected to complete their work and to meet recognized standards of quality. When homework is assigned, it is collected, often after class review and correction. There is a way to acknowledge students who attain a specified level of achievement. In these classrooms, students spend a higher proportion of their assigned instructional time actively involved in their tasks and learn more than they do in classrooms without a focus on academic work.

Cooperative Atmosphere

Another important characteristic of classrooms in which students have higher reading and mathematics test scores is a cooperative atmosphere. Teachers and students show respect for one another. Students are at times allowed and even encouraged to work to-

gether to accomplish the assigned task or to complete necessary classroom chores.

In any attempt to increase student learning, it is important that the information about cooperative atmosphere be taken into account. Efforts to increase the amount of time spent on instructional tasks, or the proportion of that time in which students are actively engaged in their work, may not be effective if the atmosphere of the classroom is ignored.

Summary

Perhaps the most important result of this research effort is that it confirms that teaching is a very complex task. Teaching is more than performing one set of "right" actions over and over. It is not simply providing materials from which students will learn. Teaching is the process of allocating instruction time and assigning instructional tasks in such a way that students have opportunities to learn all skills, have a high rate of success and high rate of engagement in their work, work cooperatively with other students, and focus on academic work. The three major concepts of *extensive coverage of content with high individual student success rate* and *active involvement in instructional tasks* are almost mutually exclusive with a large class and, as such, represent an excellent example of the complexity of teaching.

These concepts may seem familiar, like old adages cast in new terms. Yet, in this case, some of the old adages like, "students need to be successful in their work," have been recast into more specific statements like, "students need to spend a large portion of their time on tasks in which they can get most answers correct," and are supported by the findings of research, in addition to intuition. It is easier to argue for old truths when they are supported by research evidence.

⁵ W. J. Tikunoff, D. C. Berliner, and R. C. Rist. *An Ethnographic Study of Forty Classrooms*. San Francisco: Technical Report No. 75-10-5, Beginning Teacher Evaluation Study, Far West Laboratory for Educational Research and Development, 1975.



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