In this chapter I will define what an effective teacher is and discuss the ways in which effective teachers run their classrooms. I will also describe academic learning time, a concept or variable for which I believe has great heuristic value for helping to decide whether or not a teacher is likely to be effective. These ideas will be used to demonstrate that we can now predict who will be an effective teacher and who will not when achievement-test scores are used as the standard by which we judge effectiveness. We will also develop a simple theory of classroom instruction, a theory that increases our understanding of what teacher behaviors and classroom activities might contribute to teacher effectiveness.

A DEFINITION OF EFFECTIVENESS

Some scholars would call a teacher effective if the correlation between social class and achievement in his or her classroom was near zero. Such a definition, however, makes the judgment of effectiveness dependent on test performance that shows nearly equal levels of achievement for economically disadvantaged and economically privileged children in the same classroom. Since socioeconomic status is related to family values and behavior, and since such family values and behavior also relate to school achievement, it is not easy to eliminate the correlation between socioeconomic indicators and school achievement.

Another definition would designate an effective teacher someone whose class is one standard deviation or more above the mean achievement level of similar classes. This definition equates effectiveness with
a standard of classroom performance—the eighty-fifth percentile rank (or higher) on an achievement test. The cut-off point is, of course, an arbitrary one; the cut-off point relatively high, one ensures that only a small number of teachers (15 percent) will ever be considered effective in a single study or in a single year.

The definition of effectiveness that I propose to use is a much looser one. I define an effective teacher as one whose students end up possessing the same or better knowledge and skills than the average of the particular type of student (say, fourth graders, low-ability general math or advanced placement biology students). In other words, effectiveness here means simply that teachers get most of their students to learn most of what they are supposed to learn.

The Difference Between Good Teaching and Effective Teaching

Note that this definition of effectiveness requires an understanding of what students are supposed to learn. That is, one must have clear ideas about the outcomes expected from a given instructional activity. The teacher's role is one of the oldest in education. Determining what issue of outcomes is one of the oldest in education. Determining what issue of outcomes is one of the oldest in education.

Considerable reliance on human judgment, with all its frailty. Such judgments should take into account the kinds and numbers of students a teacher has worked with and the kinds and numbers of outcomes associated with instruction at a particular grade level or in a particular course. A knowledgeable judge evaluating teachers' effectiveness is expected to possess well-grounded beliefs about what might be reasonable levels of performance under the conditions that exist in a particular instructional setting. Our definition of effectiveness is not dependent on arbitrary cut-off points or the complexity of the research task and in communicating clearly with his or her colleagues. The evaluators of classroom teachers—principals, curriculum coordinators, peers—should take the researchers' ideas about effectiveness seriously, but at the same time they must take a broader perspective about the nature of teacher effectiveness than we will discuss here.

THE CLASSROOMS OF EFFECTIVE TEACHERS

The simplest summary of how the classrooms of effective teachers differ from those of less effective teachers is that the more effective teachers deliver a curriculum that matches the expected outcomes. In the classrooms of the less effective teachers, either the curriculum is not delivered in sufficient quantity, or the curriculum that is delivered is too well matched to the expected outcomes.

Clearly, we need to explore this assertion, which may sound too commonsensical, or too much of a truism to be useful, or too down to earth, or too vague. To such criticisms, I offer two replies. First, simple
ideas may have considerable utility. Second, from extensive observation in classrooms, I have learned that common sense knowledge does not always result in either common, that is widespread, or sensible practices. Let us start to unravel these ideas about effective teachers in discussing again, the outcomes of instruction.

**Instructional Outcomes and Opportunity to Learn**

Any discussion of effectiveness, as we noted above, requires an understanding of the outcomes of instruction. The effective teacher knows outcomes and provides his or her students with the opportunity to learn the knowledge and skill that they are expected to acquire. The effective teacher ensures that the curriculum and the desired outcomes are aligned, that they are congruent. The effective teacher sees to it that students are provided with the opportunity to learn the things they are supposed to learn. That this "opportunity to learn" is a necessary condition for learning to occur is one of the most consistent findings in our field (Carroll, 1983; Cooley & Leinhardt, and points of agreement in our field (Carroll, 1983; Cooley & Leinhardt, 1980). A teacher must seek from or design with district administrators at the particular level, for a particular course, in a particular community. In no way does this imply that teachers need not objectives for reading, 74 objectives for mathematics, and a few hundred others for science, 10-15 objectives for reading, another dozen or so for mathematics, and another dozen or so for the rest of the curriculum are reasonable. For a single course, as in junior or senior high school, aspirational goals, aspirations. For a single course, as in junior or senior high school, a dozen or more objectives are all that is necessary to proceed with any kind of study or program to determine teacher effectiveness.

Naturally, if test instruments are used to assess instruction, they must be matched to the goals and objectives of the school district. It is impossible for teachers to be found effective if they teach one thing but find themselves tested on another. It is unfortunate that school districts and teachers have, far too frequently, been foolish enough to accept standardized achievement tests that are poorly matched to the curriculum. Standardized achievement tests are often unthinking tests that are poorly matched to the curriculum. Standardized achievement test scores of students accepted as indicators of the effectiveness of schools and teachers. Such tests, we should note, must necessarily be careful because they provide no assessment of the many other things teachers may have taught.

Providing students with an opportunity to learn what is supposed to be learned is the key concern. If a test is used as an indicator of the things a student was supposed to learn, then the test must reflect the objectives of instruction in the same way that the curriculum must reflect the objectives of instruction. Teachers judged to be effective find ways to match the objectives, curriculum, and testing practices. Ineffective teachers do not. They do not offer their students the same opportunity to learn. This may sound simple, but it really is not. If it were simple to align the curriculum with the outcome measures, most of these teachers would gladly do so. For reasons we do not yet fully understand, some teachers do not perform this task well.

**Delivering the Curriculum**

Let us unravel our simple view of effective teachers further. We said the effective teacher delivers a curriculum that is matched to outcomes. I would consider a curriculum to be "delivered" when students have the opportunity to spend sufficient time engaged in and succeeding at tasks that are related to the desired outcomes. **Engagement and success** are the key concepts. They are discussed next, along with the concepts of **allocated time and academic achievement** concepts that help clarify our discussion of the ways effective teachers run their classrooms.

The concept of **allocated time** was presented in Chapter 1. The salient fact uncovered in the research on how elementary teachers allocate time was that the variability across classes was enormous. One teacher would allocate 20 minutes a day to mathematics; another teacher would allocate 71 minutes. One teacher would allocate about three-quarters of an hour to reading and language arts each day; a second teacher would allocate about 2 hours. This range in allocated time in classrooms is consistently associated with variations in student achievement on tests. Thus allocated time must enter into our concern about teacher effectiveness.

Because teachers do not usually keep track of how they allocate classroom time, some teachers probably spend too little time per day on the subject matter they are committed to teaching. When teachers allocate too little time to a subject, the achievement scores of students will be low. The effective teacher, at a minimum, allocates sufficient time for learning a subject. The subject about how much time to allocate to a curriculum area is a decision about what opportunity to learn a student will have. Since opportunity to learn is a crucial variable in discussions of classroom teaching, time allocated to instruction takes on special significance.

Important decisions about how to allocate time must also be made by junior and senior high school teachers. However, these decisions are concerned with content areas within a particular subject area. Both elementary and secondary-school teachers must make choices about how much time to allocate to each content area of the curriculum they teach. For example, when teaching mathematics, how much time
A SIMPLE THEORY OF CLASSROOM INSTRUCTION

beating spent by students in inquiry activities rather than in, say, worksheet or other facts-and-figures activities. A belief in the usefulness of whole language approaches to reading ought, in some way, to be manifested in the classroom. Observations should reveal that less time was spent in activities that resemble decoding activities and that more time was devoted to silent reading of prose or other comprehension activities. Philosophy-as-expoused is mere talk. Philosophy-in-action results in an activity having some measurable duration. An educational philosophy is translated into action when it can be observed in classrooms and measured by allocated time. The effective teachers seem to find ways to have their beliefs become realities in their classrooms. The opportunities for learning in the classroom of an effective teacher are those that are compatible with that teacher's beliefs about instruction.

Engaged time was also discussed in Chapter 1 and identified as an important practical concept for thinking about instruction. Classrooms generally range along a continuum from about 50 percent to 90 percent time-on-task by students. Effective teachers are at the higher end of this range. Their students are on the tasks they are supposed to be on, 75, 85, or 90 percent of the time. If the curriculum is too short, students will not have the opportunity to learn what they are supposed to learn. When a teacher's management system or motivational system breaks down, time-on-task plummets, and little curriculum is actually delivered to the students. We have learned that when we find large differences among classes in engaged time with a curriculum, we also find substantial differences in achievement in that curriculum area.

Data collected by Rossmiller (1982) make this point quite clearly. They reveal that for low-ability children, the variance in reading and mathematics achievement accounted for by engaged-time variables can reach as high as 73 percent! Even for the highest-ability groups, the mean variance accounted for in reading and mathematics achievement was about 10 percent. (These data should be contrasted with the amount of variance accounted for in some medical research studies discussed in Chapter 1.) Thus engaged time also appears to be an important predictor of achievement.

A high rate of engagement is a characteristic of classrooms managed by effective teachers. It should also be noted, however, that the desired levels of engagement within a classroom are more easily attained in schools where the entire staff is concerned about this issue. It is easier to be an effective teacher if one is in an effective school—one that promotes safety, order, a businesslike atmosphere, high expectations for achievement, and rewards for such achievement.

Success rate was also discussed in Chapter 1 as a variable of some importance when thinking about schooling. Until recently, many educators had argued that teachers should work hard to develop a high
pains to avoid having a student spend too much time in such frustrating situations. Thus most teachers see it that students spend only 0–3 percent of their time in such a stressful environment (Fisher et al., 1978). Yet the same study that found generally low amounts of time spent in failure experiences also found that students in some classes were observed being assigned to activities or materials that resulted in a low-success experience 10 percent or more of the time. It appears that some teachers are not monitoring the instructional situation carefully enough and are allowing students to spend relatively large amounts of school day in what must be a very frustrating environment. Self-concept and achievement are bound to be lower when large amounts of time are spent in low-success activities.

It should not really be surprising that high and low success rates in the classroom predict higher and lower performance on achievement tests. If the curriculum and tests are matched to any degree at all (and they really should be matched quite well), then the knowledge and skills derived from the materials and activities a student works on in the class should be related to the knowledge and skills needed to answer the test items. If a student is successfully accomplishing workbook activities, answering worksheets correctly, and answering teacher questions correctly, then that student should also be able to answer correctly test items related to that material and to those classroom activities. Similarly, if the student is not answering teacher questions correctly, performing poorly on worksheets, and unable to follow instruction, then he or she is likely to answer similar items on tests incorrectly. When curriculum and tests are aligned, a student's classroom success rate predicts his or her test performance.

Now that we have discussed the outcomes of instruction, allocated time, engaged time, and success rate, we are ready to discuss the concept of academic learning time (ALT). This concept has great heuristic value for thinking about classroom instruction and predicting who might be an effective teacher. We shall define ALT as that part of allocated time in which students are engaged with materials or activities related to the outcome measures that are being used and in which students experience a high success rate. ALT is, to me, one of the more useful concepts for judging whether student learning is taking place at a particular moment in some particular curriculum area. It is a variable we can observe and measure in the classroom, and it has known relations with student learning. Thus it is a sensible variable to use when trying to decide if a teacher is going to be effective or not.

All of the variables discussed so far as correlated with or causally related to measures of achievement are incorporated into this single variable. Allocated time, engaged time, success in class, and the relationship of classroom activities to outcomes are all incorporated in the definition of ALT. The utility of ALT is based on the concept's logical
nature and the successful demonstration that achievement can be predicted with it. For example, in that part of the research by Fisher et al. (1978) concerned with second-grade achievement, 17 outcome measures were identified. These included decoding blends and long vowels, comprehension, addition and subtraction with regrouping, and linear measurement. The variables that make up ALT—allocated time, engaged time, and success rate in a given content area—were used to predict achievement in the 17 content areas. Allocated time was a positive predictor of achievement in the 17 different areas 14 times. Engaged time was a positive predictor of achievement 15 times. High success rate was a positive predictor of achievement in the 17 areas every time. Low success rate was a negative predictor of achievement 14 times.

Many of these relationships were statistically significant. Furthermore, when we examined how much of the variance in these 17 different measures could be accounted for by the ALT variables taken as a set, we found further support for the idea that ALT is an important concept. After we statistically removed the effects of the students’ entry ability, on a variety of measures we were able to account for between 1 percent and 22 percent of the variance in student achievement. On average, across all sorts of content areas and in different grades, ALT consistently accounted for about 10 percent of the variance in students’ achievement. (This should be compared to the medical research reported in Chapter 1.) Thus ALT has proven to be a useful concept or variable for thinking about classroom instruction.

Effective teachers seem to keep ALT in mind as they instruct, though they rarely call it by this name and rarely make their cognitive processes conscious so deliberately. Effective teachers seem to know the outcome measures used for instruction, assign activities related to those outcome measures, see to it that enough time is allocated for students, find ways to keep students engaged, and ensure that the younger or lower-achieving students spend large percentages of time in high-success experiences. In short, the students of effective teachers accumulate a good deal of ALT. Empirically, students and classes that accumulate high levels of ALT are those that are likely to achieve more than students or classes that accumulate lower amounts of ALT.

Let us return now to our initial simple statement about what constitutes effective teaching. We stated that the effective teacher delivers a curriculum that is linked to certain outcomes. Delivery of the curriculum requires the teacher to find ways to ensure that allocated time and especially engaged time are sufficient for learning and that the materials and activities students are engaged in lead to high success. That is, an effective teacher controls ALT, providing students with the chance to learn what they are supposed to learn. Perhaps, at this abstract verbal level, the definition of an effective teacher is as simple as it has stated—it is simply a person who delivers a curriculum related to valued outcomes.

CAN SIMPLE VIEWS OF EFFECTIVE TEACHING PREDICT EFFECTIVE TEACHERS?

A good test of whether or not one’s views about some phenomenon are useful to a scientific community is to see if they can predict that phenomenon. Scientific theories are often validated in this way. For example, when Einstein predicted early in the twentieth century that light would bend, due to the gravitational pull of a heavenly body, his colleagues were dubious. At that time, no measurement system existed to test his theory. About 15 years later, however, his theory was verified, and his views about light and gravitational forces had to be taken much more seriously. Prediction is thus a way to validate a scientist’s ideas. Successful prediction will not tell us if ideas or theories are “true.” Someone who might predict the summer solstice very accurately might also believe that a sun god changes direction on that day. Thus accurate prediction and the “truth” of a theory are not the same thing. But an accurate prediction makes you want to take someone’s ideas more seriously than if those ideas could not be used to predict the phenomenon on which they focused.

Two separate tests of how the ALT conception of the way effective teachers operate their classrooms were undertaken by students of mine, David Lynn and Michelle Ellis Schwalbe. In both studies, observers were given minimal training in the use of observation instruments concerned with allocated time, engaged time, success, the teacher’s classroom behavior, classroom climate, and so forth. In both studies, about 25 teachers of second through sixth grades were studied. Observations ranged from three to eight visits in each class. Reading and mathematics instruction were the focus of the observations. Performance on the California Achievement Test was the outcome measure used in both studies. Tables 1 and 2 present the results of these two small studies, which were instructive, though, in many ways, not well designed. They were our first attempts to see whether the variables we thought were related to teacher effectiveness could really be used to predict which teachers would be and which teachers would not be effective in producing gains on the standardized achievement tests used by these school districts. From the magnitude of the multiple correlations (the columns labeled multiple R), we see that the set of variables that we thought would predict performance on standardized tests actually did so. When we examine the total amount of variance accounted for (the columns labeled multiple R²) we see that this set of predictors accounts for substantial amounts of the variation in the achievement scores of these students. When we go on to ask whether there is a unique contribution to the prediction of achievement that certain clusters of the variables make, we see that the time and success variables—that is, the ALT variables—often uniquely account for some of the variance in achievement. These data also inform us that the time and success variables...
Table 1. Prediction of Test Performance by ALT Variables: Study 1.

<table>
<thead>
<tr>
<th>Outcome Measure:</th>
<th>Overall Prediction</th>
<th>Variance Accounted for Uniqueley</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Multiple R</td>
<td>Multiple R²</td>
</tr>
<tr>
<td>Math applications</td>
<td>.79 .62 .32 .11 .20</td>
<td></td>
</tr>
<tr>
<td>Math computation</td>
<td>.64 .41 .32 .15 .16</td>
<td></td>
</tr>
<tr>
<td>Math concepts</td>
<td>.51 .26 .13 .13 .07</td>
<td></td>
</tr>
<tr>
<td>Word study skills</td>
<td>.37 .14 .09 .07 .05</td>
<td></td>
</tr>
<tr>
<td>Reading comprehension</td>
<td>.81 .65 .13 .52 .00</td>
<td></td>
</tr>
<tr>
<td>Vocabulary</td>
<td>.76 .58 .13 .20 .08</td>
<td></td>
</tr>
<tr>
<td>Total mathematics</td>
<td>.38 .14 .11 .04 .08</td>
<td></td>
</tr>
<tr>
<td>Total reading score</td>
<td>.74 .39 .05 .13 .05</td>
<td></td>
</tr>
</tbody>
</table>

Number of elementary-school classrooms = 25. Approximately 5 observations per classroom.

Sources: Unpublished study by David Lynn, 1980.

Do not always predict achievement, and they sometimes predict achievement for some outcome measure but not for others. This means we should be cautious in how we interpret our findings. Nevertheless, these studies lead us to be optimistic overall.

We would argue that with a well-polished study, with carefully trained observers, and perhaps with as few as five or seven observations per classroom, we might be able to predict effective teachers quite well. If classroom observations could be made, say, between October and December in an academic year, and analyses of the data could be made over the Christmas break, then the most and least effective teachers in the sample observed could be identified by the beginning of January. Identifying those teachers who are predicted to be ineffective—that is, identifying those teachers and classrooms that are somehow "at risk"—means that some forms of remediation might be tried throughout the spring to help those classrooms achieve better. It does not take a high multiple correlation in a prediction study to be useful in identifying the top and bottom 10–20 percent of the teachers in a particular sample. Multiple correlations as low as .30 would be more than enough to identify accurately the teachers who would be highly effective and highly ineffective.

From these two small and imperfect studies, which used the ALT concept and related variables as predictors, we see that the development of a system to identify the most and least effective teachers in a sample is quite feasible from a technical standpoint. It would be sensible and in the best interests of students to identify teachers who are at risk in a particular academic year and to target the school district's scarce in-service dollars to those teachers. Although they are predicted not to have their students score well on standardized achievement tests, such teachers might be helped throughout the second half of the academic year to solve the instructional or management problems that led to the prediction of ineffectiveness. But it is likely that social and political problems involved in implementing such a system may prevent its use. The labeling of teachers as "at risk" is likely to lead to all the problems that have been noticed when labels such as "slow," "learning disabled," or "culturally deprived" are applied to a child. Technically, though, by relying on ALT, such a predictive system now appears to be feasible. The ALT variables do forecast which teachers will and which teachers will not be effective, accounting for important amounts of the variance in students' achievement. Thus we have evidence that requires us to take the ALT concept seriously.

Table 2. Prediction of Test Performance by ALT Variables: Study 2.

<table>
<thead>
<tr>
<th>Outcome Measure:</th>
<th>Overall Prediction</th>
<th>Variance Accounted for Uniquely</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Multiple R</td>
<td>Multiple R²</td>
</tr>
<tr>
<td>Mathematics: spring-spring gain in scale scores</td>
<td>.62 .38 .33 .06 .00</td>
<td></td>
</tr>
<tr>
<td>Mathematics: residualized scores</td>
<td>.51 .26 .12 .04 .03</td>
<td></td>
</tr>
<tr>
<td>Reading: spring-spring gain in scale scores</td>
<td>.78 .60 .04 .02 .21</td>
<td></td>
</tr>
<tr>
<td>Reading: residualized scores</td>
<td>.79 .62 .03 .02 .19</td>
<td></td>
</tr>
</tbody>
</table>

Number of elementary school classrooms = 18. Approximately 5 observations per classroom.


Academic Learning Time, Achievement, and Quality Instruction

It would be nice to find a school system that regularly studies classroom instruction to find ways to accurately identify teachers who might need extra help in a particular school year. But even without systematic use of the ALT concept as part of an ongoing assessment of classrooms, we may still find that concept useful as we view our own teaching or as we enter the classrooms of others. In fact, because ALT impels us to think about both allocated and engaged time, success rate, and the alignment of the curriculum with outcomes, it is the best variable we can use for thinking about actual student achievement.

We could choose, as we often did in the past, to rate a teacher's grooming when we visit a classroom, or we could rate the neatness of the bulletin board, or the care with which students handle equipment and supplies. But the relationship of those observable classroom...
DEVELOPING A SIMPLE THEORY OF CLASSROOM INSTRUCTION

Dozens of findings have emerged from correlational and experimental studies of teacher effectiveness (see Wittrock, 1986). These predictors of effectiveness are sensible, for the most part. In looking them over, I thought I saw a way that a simple theory fit the existing data. I believe that the teaching variables associated with effectiveness probably affect student achievement by affecting one of the components of ALT—allocated time, engaged time, success, or the congruence of tasks with outcome measures. That is, one way we may understand the findings that keep emerging about teacher effectiveness is to ask how these findings might be related to one of the known correlates of achievement. Stating this as a theory, I would simply hypothesize that effective teachers deliver a curriculum that is matched to outcomes. Effective teachers provide their students with better opportunities to learn what it is they are supposed to learn, and they do so by attending to time variables and success variables and by matching the curriculum and the outcome. Let us briefly test how this theory might be applied.

When we find out, for example, that pacing is a consistently positive predictor of achievement, and that effective teachers characteristically go through the curriculum at a faster pace than their less effective colleagues do, we can easily satisfy one goal of science, that of prediction. When we hypothesize that pacing is a consistent predictor of achievement because it results in preventing or allowing students the opportunity to learn the things that they are to be held responsible for learning, we are striving to attain another goal of science—namely, understanding. Prediction, we noted earlier, can occur without much understanding. But when you feel you understand why some instructional phenomenon occurs—when you “make sense” out of the myriad things that go on during instruction, when you order them or see how they fit together—then you are developing a theory of instruction (see Snow, 1973).

Structuring is another variable that has been found to be a predictor of teacher effectiveness. Teachers who share the goals of a lesson with students, who provide clear directions at the start of a lesson, who provide introductions, advance organizers, reviews, and summaries, and who, in general, structure the activity for students in an unambiguous way are usually more effective than teachers who do not engage in such activities. These findings provide us with data to predict effectiveness. To understand why structuring acts as it does is a bit harder. In line with our simple theory, however, we would hypothesize that structuring works because of a number of factors. When a teacher provides clear directions, a reduced error rate occurs because students are aware of what they are supposed to be doing. The teacher who often gives intelligible and short directions at the start of an activity is also ensuring higher engaged time. Since students know what they are to be doing, they cannot easily act befuddled or honestly remain unengaged. Summaries and reviews also expose students to key ideas and information, possibly increasing the congruence of the curriculum to the tests used to measure achievement in that subject area. Reminding students about the reason they are doing certain tasks decreases students’ feelings that tasks are mindless, thus increasing their motivation to learn, resulting in higher rates of engaged time in class and possibly higher allocations of overall time if students choose to work on such tasks when they have uncommitted time. I think our theory helps us in understanding how this reliable predictor of achievement might work.

Monitoring is another variable found to correlate with achievement. In the United States, elementary-school students work independently,
success rate, or the relationship between what is taught and what is tested. Teachers who control ALT, or the set of variables subsumed by that concept, are teachers whose students will achieve well, at least on our traditional measures of student achievement.

We have come a long way in our understanding of effective teachers since William James started advising teachers about how to think about their art. We have simple ideas of considerable utility with which to think about instruction. These ideas infuse the art of teaching with rich concepts so that classroom experiences can be ordered and discussed in meaningful ways and so that predictions can be made and verified. These ideas are beginning to provide a scientific underpinning to the complex and dynamic art of teaching.

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