Chapter 2

Analyzing Student Behavior

Educational programs are designed to facilitate student learning. Much of that learning is supposed to occur in school as a consequence of the experiences students have in classes. It stands to reason that you can find out much about the teaching/learning process by carefully studying student behavior in class. Siedentop and Tannehill (2000) assert, "If you want to learn about or evaluate the effectiveness of a physical education teacher, you have to watch the students, not the teacher" (p. 27). Physical education classes can be broken down into four major chunks of time: (1) managerial tasks such as forming teams; (2) physical activity tasks (also known as motor engagement); (3) receiving information; and (4) waiting for a turn.

Studies of student behavior in physical education classes produce some surprising results. For example, in the first major study of this kind at Teachers College, Columbia University, Costello and Laubach (1978) examined the behavior of 193 students in 20 different elementary classes and found that they spent only 28.7% of their time actively engaged in movement activities, while the bulk of their time was spent "waiting" (35.4%) or "receiving information" from the teacher (25.4%). They concluded that students in physical education are more likely to be waiting and listening than they are engaged in physical activities. Their results raise questions about whether physical education class time is being used efficiently. Behets (1997) found that when students are first learning a motor skill, they learn more from practice than from verbal instruction and demonstration. If you stop and think about this, it makes sense that students need lots of practice to learn new motor skills.

Unfortunately, more recent studies produce results similar to the earlier studies. Students typically spend less than 30% of class time motor engaged and not the 50% that is recommended in *Healthy People 2010* (U.S. Department of Health and Human Services [USDHHS], 2000). Metzler's (1989) review of research on time shows that 25–50% of class time is used for noninstructional activities. LaMaster and Lacy (1993) studied junior high students in nine physical education classes and found that students were engaged in motor tasks at a high success rate during only 14.6% of class time. In a much larger study in southern California with 430 physical education classes, researchers found that students spent about 34% of class time at a moderate activity level and 15% at a very active level for a total of 48% of moderate to vigorous physical activity (MVPA) (McKenzie, Marshall, Sallis, & Conway, 2000). This is higher than the results of a similar study of third-grade classes in four states, where MVPA was found in only 36% of the class time (McKenzie et al., 1995).

How about the students in your classes—how do they spend their time? What sort of opportunities do they have for practice? Play? Instruction? Exercise? How much of students' time in physical education is spent in physical activity? Don't be too quick to answer. Your subjective impressions of student behavior may not be consistent with objective reality. This chapter is designed to equip you with techniques for carefully studying student behavior and to provide you with a clear and objective picture of student behavior in your classes.

Descriptive Analysis

An approach called descriptive analysis has been employed to record student behavior. Since the early 1970s, descriptive analysis has been used extensively in research on teaching. The Data Bank studies at Teachers College, Columbia University, developed and used several descriptive systems to analyze events in physical education classes (Anderson & Barrette, 1978). The descriptive-analytic approaches in this chapter and elsewhere in this text are based, in part, on one or more research projects. The approaches suggested here have been simplified to facilitate their use in teacher education settings, but these techniques should provide you with more than enough data about your teaching.

Descriptive analysis differs in a number of important ways from the informal analysis you have just experienced. The approach is planned and systematic. In advance, you know rather precisely what to look for during the observation and what to do when you see it. You describe student behavior (rather than evaluate it) by classifying behaviors into predefined categories, a process called coding. The record that emerges is reasonably objective and reliable. That is, two people using this approach to code the same students in the same class should come up with similar records; and if you recoded the same students' behavior during the same class (from a video recording), both records would be very similar. Thus, the information recorded is often referred to as data because it so closely resembles a factual description of what occurred rather than the subjective impressions and opinions of the observer. High levels of objectivity and reliability are obtained in research studies using descriptive analysis. Typically, trained coders using carefully developed descriptive systems achieve 85% to 99% agreement. Of course, you can expect lower levels of agreement when you use the approaches suggested here because the categories and coding procedures are less precisely defined and your training as an observer is minimal.

Three introductory techniques for coding students are covered in this chapter, including student time, student practice trials, and student behavior. They are a small sample of the vast array of coding procedures available and focus on only a few of the countless aspects of student behavior that you might examine. To familiarize yourself with each technique, start by coding students in someone else's class. If you are fortunate enough to have a video camera available, have someone video record your class. You can then code it, and, hopefully, the data you collect can provide a meaningful basis for making decisions about how to conduct subsequent classes. If the data indicate a need for change,

you should plan the changes, reteach the class, and recode student behavior to determine whether the change(s) produced the desired result.

How Are Students Spending Their Time?

Psychomotor learning in physical education requires lots of quality practice, but some students spend only two or three periods a week in physical education—perhaps 60 to 100 minutes of actual contact time or even less in some elementary programs. That is not a lot of time, so you must plan time judiciously if you hope to accomplish your goals. With the current problems of childhood obesity and juvenile diabetes, the amount of time students are physically active in physical education class has become even more important than it was in the past.

One way to obtain a meaningful account of students' behavior is to record the time they spend in different types of activity. In particular, distinguish between activities that are likely to contribute to educational outcomes and those that are not. Clinical Task 5

CLINICAL TASK 5

Coding Student Time in Activities

1. Identify a target student whose behavior you can code during the class.
2. Use the category definitions, coding procedures, ground rules, and record form (Box 2-1 and Box 2-2) to code the student's behavior during alternate 3-minute segments of the class.
3. Compute the total time and percentage of time spent in each category of activity.
4. Have someone else code a target student in one of the classes you teach and compare the results with your analysis (optional).
5. Study the record. You or the teacher should make notes under Summary Comments and Evaluation about any features of the record that strike you as important, particularly those features that have a bearing on how well the student spent his or her time.

Reflection

Compare your results with the research on how students spend time in physical education and with the recommendations for more ideal use of time. Speculate about the reasons for your results and make at least one recommendation to the teacher for improvement. For example, if your coding shows a motor-engaged percentage of 60%, you might discuss the factors in the lesson that enabled the students to be motor-engaged at a high level. Discuss what you learned from this task about your own teaching. Then, write a paragraph that reflects what you learned about using this tool to analyze teaching.

suggests that you code 3-minute samples of the behavior of one student at a time during a class. You use an interval recording technique (Siedentop & Tannehill, 2000). During each 3-minute time segment, code student behavior every 5 seconds. Throughout the class period, code for 3 minutes, and then rest for 3 minutes. During the rest periods, you may find it helpful to record notes about what occurred in the class. Coding only one student at a time is mandatory if you hope to achieve an accurate record. It is virtually impossible to code two students at once with any degree of accuracy. Select a student whose behavior you are interested in for one reason or another—perhaps an "average" student whose behavior might reflect what the average students are doing or perhaps a special individual whose behavior you would like to know more about.

To code behavior accurately and consistently, you need definitions of categories of behavior. The category definitions in **Box 2-1** delineate the boundaries of the six broad categories you use in completing Clinical Task 5. They are a simplified and restructured version of the categories developed by Laubach (1975). The major thrust of this particular set of categories is to distinguish between behaviors that typically contribute to the achievement of educational outcomes (performs physical activity, receives information) and those that do not (waits, management tasks, and other). Study these definitions before attempting to code a student.

To complete this clinical task you have to prepare and use a coding form. A sample form appears in **Box 2-2**. Study the form for a moment to better understand the kind of record that emerges from this type of analysis. The coding procedures in Box 2-1 tell you how to carry out the coding. Notice that you are to code behavior for each 5-second interval. Shorter intervals make coding too laborious and require more training, whereas longer intervals encompass too many different kinds of events to be useful. Furthermore, you use interval recordings rather than exact duration timing (i.e., timing each behavior to the second) because accurate duration timing is only possible when you code from videos, which can be stopped and replayed.

You will undoubtedly encounter some difficulty in making coding decisions. After all, real-world events occur in a continuous stream, not in 5-second intervals. Many events don't fall neatly into a category but in some gray area between categories, and even 5-second intervals often contain more than one type of behavior. To help resolve some of these difficulties, follow the "special ground rules" in Box 2-1.

At this point, please don't be scared off by what may appear to be an imposing coding task. It's really quite easy once you get into it. It takes teachers only about a half hour to learn to use this approach with reasonable proficiency.

How Much Practice Are They Getting?

If there is one thing most physical educators have in common, it's a concern for improving the students' proficiency in motor skills or tasks. It is well established that improvement comes with practice, and most teachers are reasonably committed to providing adequate

BOX 2-1

Definitions, Procedures, and Ground Rules for Coding Student Time in Activities

Category Definitions

1. *Performs Physical Activity:* Actively engages in a motor task normally considered to be the subject matter of physical education, including playing game or sport, practicing skill, performing exercise or calisthenics, and exploring solutions to movement problems
2. *Receives Information:* Listens to teacher or other student; attends to demonstration, audio-visual aid, or written material
3. *Waits:* Engages in "holding" behavior, for example, waiting for a turn or waiting for the game to begin. Student is not performing physical activity or giving or receiving information
4. *Management Tasks:* Gets equipment, moves from one place to another, such as walking from one activity area to another or walking to get on line. Is not giving or receiving information
5. *Other:* Engages in activity other than those mentioned previously, such as getting a drink of water or tying shoes

Special Ground Rules

1. If two or more types of behavior occur during an interval, code the type of behavior that consumed the greater portion of the interval. For example, if the student "waited" for 2 seconds and practiced for 3 seconds, code as "performed motor activity."
2. If two types of behavior occur simultaneously for the major portion of an interval (which sometimes happens when students receive information while they are performing a motor activity), code both behaviors.
3. Consider the student to be performing a motor activity when she or he is executing movement, or is in a "ready position," or is completing a follow through; if a game is being played, consider the student to be performing when "time is in" for her or him.

amounts' of in-class practice for their students. Obviously, the quality of practice is at least as important as the amount. Chapter 4 details additional qualitative features of practice in subsequent clinical tasks.

Informal analyses of classes often yield misleading impressions as to how much and what kinds of practice students are getting. For example, you scan a gymnastics class with

BOX 2-2

Clinical Task 5 Sample Coding Form: Time Sampling of a Single Student's Behavior

Directions: Record a tally mark for each 5 seconds of student activity.

Target Student: _____

Class: _____

Segment (3 min)	Performs Physical Activity	Receives Info.	Waits	Management	Other	Notes
I						
II						
III						
IV						
V						
VI						
Totals	F =	F =	F =	F =	F =	TF =
	% =	% =	% =	% =	% =	

Summary Comments and Evaluation: _____

_____

eight different practice stations and gain the impression of profuse and varied activity—when in fact most students spend 50% of their time waiting for a turn. You watch a soccer game and perceive 15 or 20 minutes of continuous motor activity—and yet fail to notice that several players never touch the ball. Students are busy practicing their basketball dribbling, but you miss the fact that students are spending much of their time chasing loose balls. Rather than relying on informal eyeballing, look at students' practice more systematically.

During the last 30 years, researchers have provided strong evidence that when learners are engaged in the content at a successful rate, they learn more. The importance of a high success rate was first demonstrated in the Beginning Teacher Education Studies in Math and English (BTES; Fisher et al., 1978). The concept of Academic Learning Time (ALT)

emerged from the BTES studies, and that concept was extended to Academic Learning Time—Physical Education (ALT-PE) by Metzler (1979). ALT-PE is defined as "the amount of time a student spends engaged successfully in activities related to lesson objectives" (Siedentop & Tannehill, 2000, p. 24).

Most experts agree that students' success rate should be close to 80% when students are learning a new skill. Most important, remember that students learn best when the teacher maximizes the number of correct practice opportunities. In one study of fourth graders learning soccer skills, the total number of *correct* practice trials, not just the total number of trials, was related to achievement (Ashy, Lee, & Landin, 1988). Earlier, Silverman (1985) also found that student achievement is significantly correlated with the number of appropriate practice trials. At least one other research study showed that there is a significant and high correlation between correct practice trials and achievement (Buck, Harrison, & Bryce, 1990). Lund (1992) demonstrates that the teachers' accountability system also had an effect on students' practice trials and quality of practice. She was able to link the opportunity to respond (OTR) with the ways teachers hold students accountable during class because the teachers in her study who had the strongest accountability systems produced the greatest number of correct motor responses by students.

Goldberger and Gerney (1990) suggest that planning for the practice style of teaching needs to include consideration of students' skill level and the task difficulty. They found that even when the teacher used the same instructions, students took different amounts of practice trials in the same time period. Lower skilled students, especially, may benefit from more practice because they tend to take fewer practice trials during practice time and their attempts tend to be less successful than other students' attempts (Buck, Harrison, & Bryce, 1990). On the other hand, higher skilled students tend to take more practice trials and they have the highest percentage of appropriate trials (Silverman, Subramaniam, & Woods, 1998).

Teachers need to actively encourage more productive use of practice time by being explicit about how many trials are expected in a time period (Goldberger & Gerney, 1990). Buck and Harrison (2001) conclude their discussion of this topic with the following emphatic statement: "Physical education teachers need to increase the number and quality of learning trials if students are to become proficient in motor skills" (p. 104). They suggest that teachers periodically calculate the total number of trials and the number of correct trials of their students.

One very simple way to obtain an objective account of how much practice students get is to observe students and count the number of successful or unsuccessful practice trials they take during a selected period of time. This is precisely what Clinical Task 6 asks you to do. The analytic technique this chapter suggests is similar to the one you used in Clinical Task 5, except in this task you follow two students at a time and describe what they are doing by coding students' practice trials into preselected categories. This type of coding is called "event recording" (Siedentop & Tannehill, 2000). Select two students who are practicing in the same area of the floor (e.g., a pair practicing hitting, two players

on the same team). This time, however, you have to generate your own categories based on the skills/tasks that students in the target class have an opportunity to perform. Furthermore, instead of coding at 5-second intervals, you code only when the event occurs, in this case, a practice trial. Finally, you needn't code the students for the entire period but instead choose a logical time segment for observation—perhaps a practice session, or a game, or free play time.

All in all, this method of analysis is very easy to use and the record it yields can be fascinating. You can obtain a much more specific account of the students' physical activity than you did in Clinical Task 5 (although the account won't be continuous). Further-

CLINICAL TASK 6

Coding Student Practice Trials

1. In your typed notes that you submit for this task, begin with a description of the setting, including grade level or age, gender, skill level, and any other relevant information.
2. Identify at least two target students whose practice trials you will code during the class (e.g., a boy and a girl, a high- and lower-skilled student, a behaving and a misbehaving student). The two students should be practicing near each other.
3. Identify the key skills or motor tasks the students have an opportunity to perform during the class and describe what constitutes a successful trial.
4. Compose a coding form for recording trials on each skill or task (see the sample coding form in **Box 2-3**).
5. Code the students' practice trials during a class or a segment of a class.
6. Summarize and study the data. Make notes about any features of the data that strike you as important. In particular, consider the adequacy of the amount and distribution of trials.
1. Have someone else code the practice trials of a student in one of the classes you teach and compare the data with your coding (optional).

Note: You may want to video record a class and code several target students from the video.

Reflection

Compare the results of your coding with the research on practice trials and the recommendations for best practice. Discuss your insights gained from this task about the importance of student practice and relate those insights to your own teaching.

more, you will have a reasonably objective record of not only the amount of practice trials, but also the distribution of practice across the different tasks available and the success rate of each student.

By the way, because the clinical task title uses the term *practice*, don't think this analytic technique is applicable only to formal sports skills practice sessions. You can use it to analyze student performance in games of low organization, lead-up games, movement education lessons, and formal competitive games. Simply identify the fundamental movement tasks or skills involved in the game or lesson, define them, and then code.

You must give some thought to defining what constitutes a legitimate practice trial of a given skill or task. Whatever rules you use to help make this determination, jot them down so that you can applied them consistently from observation to observation. As a

BOX 2-3

Clinical Task 6 Sample Coding Form: Student Practice Trials

Grade level _____

Directions: Record a tally mark each time the target students attempt a motor skill.

Length of recording time _____

	Student 1		**Student 2**	
Activity Type/Skill	**Successful**	**Unsuccessful**	**Successful**	**Unsuccessful**
Totals	# Total Trials _____	# _____	# Total Trials _____	# _____
	# Successful _____		# Successful _____	
	Success rate _____		Success rate _____	

Summary Comments and Evaluation (by the teacher): _____

_____

general rule, it's wise to be liberal in your definition of a trial—let even the most meager attempts count.

Expanding the Student Sample by Spot-Checking

Previous techniques for coding student behavior (Clinical Tasks 5 and 6) yield a record of the actions of one student or a few students in a class; these records may or may not be a reliable index of the behavior of selected groups of students or of the entire class. When it is important for you to find out what most or all of the students are doing, alternate coding techniques are required. For example, perhaps your class is divided into groups that practice separately at different stations and you want a record of how things are going at each station. Or perhaps a particular class will progress through several instructional stages—for example, from large group lecture, to individualized practice, to small group critiques, to summary and review—and you want to know what all students are doing in each stage.

You can use a technique called *group time sampling* for these purposes. Many different names have been applied to this generic technique, or to particular variations of the technique. The term *Placheck*, developed by Hall (1970) and applied to physical education by Siedentop (1983), is one popular variation. It involves quickly scanning the behavior of several or all students during a short interval (10 to 20 seconds) and classifying the behavior of each student into one of two (or possibly one of three) categories. The record of behavior for the interval is a count of students whose behaviors fall in one category or the other.

You might spot-check the behavior of the whole class at fixed intervals, spot-check a selected group of students throughout the class, or check student behavior at a particular station throughout the class. You could also check behavior at several stations on a rotating basis or concentrate spot-checks within one segment of the class. The type of spot-check you select should depend on the structure of the particular class and on what you want to find out about it. Because spot-checks involve only momentary perceptions of each individual student, the classification of student behavior has to be kept very simple—hence the recommendation that only two, or at most three, categories be used. This allows the observer to quickly scan individuals within a group, keep track (mentally) of the number who are or are not doing something, and then record those numbers. It is not possible to do this using four or more categories. Multiple categories force you to record behavior on a student-by-student basis and to observe each student for longer intervals (as in Clinical Task 5).

In completing Clinical Task 7, the choice of categories is up to you. Two sets of categories, such as active/inactive or on-task/off-task, are commonly used in spot-checking (see **Box 2-4**).

Spot-checking categories provide a gross indication of whether students are involved in productive activity (active) or not, and whether they are doing what they are supposed

BOX 2-4

Clinical Task 7 Sample Coding Form: Spot-Checking Student Behavior

Scan	Describe What Is Occurring in the Lesson	# of Active Students	# of Inactive Students
5 min			
10 min			
15 min			
20 min			
25 min			
30 min			

Summary Comments and Evaluation (by the teacher): _____

_____

to (on-task) or not. Other dichotomous sets of categories that might prove useful are safe/unsafe, attentive/inattentive, cooperative/disruptive, and interacting with others/isolated. Whatever categories you choose, they should reflect a significant aspect of the particular class being observed. Also, you should define each category in advance by listing the activities that fall under it.

In performing the spot-check itself, try the following:

1. Scan from left to right across the gym.
2. Classify the behavior of each individual student at the moment your eyes come in contact with him or her.
3. Keep count (mentally) of the *less frequently* occurring behavior category (e.g., in an active class keep count of the inactive students; in a well-behaved class keep count of the misbehaviors).
4. Record the total for the *less frequently* occurring behavior; then, subtract it from the total number of students in the class (or group) to obtain the total for the more frequent behavior.
5. Take notes at the end of each spot-check to help you recall important aspects of what was taking place.

Characteristics of Student Codings

Once you have completed Clinical Tasks 5, 6, and 7, take some time to examine the characteristics of the analytic approaches you used. In each instance, your observation and analysis had a preplanned focus. You defined behavioral categories and followed certain rules in collecting data and in sampling student behavior. You accounted for the ways in which selected students distributed their time among certain types of activities (Task 5) and the number and kinds of practice trials other students engaged in (Task 6). You spot-checked the behavior of large numbers of students according to certain gross behavioral classifications (Task 7). The resulting records should be reasonably objective and reliable, although this will depend to some extent on the care with which you followed the coding procedures.

By this time, you are keenly aware of the *descriptive* nature of the emergent records; that is, they tell much about what the students were doing and very little about how well they were doing it. The distinction between describing and rating or evaluating is not always

CLINICAL TASK 7

Spot-Checking Student Behavior

1. Given your understanding of the potential and limitations of spot-checking, choose a class about which spot-checks will yield useful information.
2. Use active/inactive or on-task/off-task categories or develop and define a set of categories of your own.
3. Decide on the behavior to be sampled—that is, whole class/group, by station, number of checks, and so forth.
4. Develop a coding form, and code using the procedures suggested earlier. Scan every 5 minutes for up to 30 minutes.
5. Study the record. Make summary comments and evaluations of any features of the record that strike you as important.
6. Have someone use spot-checking to code the behavior of students in a class you teach (optional).

Reflection

What have you learned about teaching using this method of analysis? How will the results of spot-checking improve your teaching and your students' learning? What changes does your spot-checking suggest?

clear-cut. In fact, in Task 7, if you classified behavior as cooperative/disruptive or safe/unsafe, you may have been doing more "rating" than describing. If you reacted as most professionals do when first confronted with descriptive coding tasks, probably on many occasions you desperately wanted to rate the quality of student performances and were somewhat frustrated by the constraints of descriptive coding. The emphasis here has been on "getting the facts" first (i.e., descriptive record), and then using those data to make evaluations.

Recognize some of the limitations of the approaches you used. First, in each approach you obtained a limited sample of student behavior in a given class. In two instances (Tasks 5 and 6), you know what only one student is doing at selected times during the class; you don't know what the student is doing at other times and neither do you know what all the rest of the students are doing. In the third instance (Task 7), you know what all students or groups of students are doing at selected moments, but not what they are doing at other times. The extent to which these time samples are a legitimate representation of the behavior of the entire class is always questionable. Furthermore, you only "know" what the students were doing in terms of the limited set of categories you used for classifying behavior. All other aspects of behavior go unrecorded and perhaps unnoticed, except for some items that appear as notations accompanying the record. Indeed, you don't know how well the students performed, whether they interacted with or responded to the teacher, whether they learned anything, and so on. As with the informal analytic approaches covered earlier, you have succeeded in capturing only a small part of what happened in the classes.

At this point, see these techniques for what they are—a limited set of tools that you can use to gather certain types of information about student behavior in class, information that you can use for some purposes in some situations but not in others. Furthermore, understand that these are flexible tools that you can alter and combine in various ways to better suit your purposes.

Making Changes

One or more of the completed records of student behavior or the Summary Comments and Evaluation at the end of each record are likely to identify certain problems or suggest needed improvements in the observed classes. If so, it makes sense to try to change the classes (i.e., the teaching strategy, organization, subject matter) in such a way as to alleviate the problem or make the improvement, and this is just what you do in Clinical Task 8. Obviously, the problems you identify and the changes you implement depend on the particular characteristics of the record you use, on the target teaching situation, and on your own values and preferences. **Box 2-5** lists some problems and possible solutions commonly identified by other teachers using these coding techniques. They may or may not be relevant to your situation.

BOX 2-5

Problems and Solutions

Commonly Identified Problems	Possible Solutions (Changes)
1. Students spend too much time at beginning of period getting organized.	1. Introduce efficient organizing procedures and routines.
2. Practice organization yields too few practice trials.	2. Increase number of practice stations; use more equipment.
3. Lead-up game yields too few practice trials per student.	3. Change rules of game to increase numbers of active participants; throw out game and use a different one.
4. Competitive game (e.g., volleyball, soccer, basketball) results in minimal number of trials for less skilled in proportion to game time.	4. Use small-sided games; change the rules; group students more homogeneously; increase amount of practice time.
5. Students spend an inordinately large proportion of time listening to teacher.	5. Reduce the amount of information given to students; make instruction more concise.
6. In free practice or exploration setting, student performs one task repeatedly.	6. Give instructions or challenges that increase variety in tasks chosen; have students keep records of tasks performed.
7. Off-task or disruptive student behavior increases toward end of period or during long waiting periods.	7. Clarify rules for behavior; introduce new or more challenging activities as period progresses; reduce waiting periods.
8. Dangerous misbehavior occurs at a particular practice location.	8. Clarify rules for safe behavior; stand close to location and monitor student behavior.

For the Enthusiast

If you find these techniques for coding student behavior to be interesting and valuable, by all means continue to use them and feel free to vary them in ways that are best suited to your purposes. The following subsections list some variations in approach that you might want to try.

CLINICAL TASK 8

Using Codings of Student Behavior as a Basis for Changing Teaching

Using the records of student behavior in the classes you taught, do the following:

1. Review the records from Tasks 5, 6, and 7 and ask yourself these questions:
   a. What changes in class structure, teaching behavior, and so forth would yield improvement in one or more aspects of the student behavior recorded? (Compose list.)
   b. Which of these changes are immediately feasible?
   c. Which one or two of the feasible changes are most important?
2. Write out the changes identified in item c and indicate the way in which the change should improve the record of student behavior.
3. Reteach the class or the lesson and have someone recode student behavior using one or an appropriate combination of the coding procedures from Tasks 5, 6, and 7.
4. Analyze the extent to which the change produced an improvement in the record of student behavior. If it didn't work, try again. Change something else this time.

Reflection

What have you learned about teaching using this method of analysis? How will the results of this task improve your teaching and your students' learning? What changes are suggested by your results?

Restructuring Categories

Starting with the student activity categories (Task 5), add, delete, or refine categories to include types of student activities that you are particularly interested in monitoring. For example, you might want to divide "receives information" into "receives instructional information" and "receives other information," or add a category for spotting. Have a colleague check over the revisions to make certain they are understandable and usable. Then, use the revised categories to code student behavior.

Developing Your Own System

If you feel particularly adventurous, develop a category system of your own to code student behavior. This is the best way to make sure that you get at aspects of student behav-

ior that you believe are critical. It's also much more fun than using someone else's system. If you do so, keep the set of categories simple—don't try to use more than six or eight categories at a time. Also, make sure the categories are well defined.

More Readings for the Enthusiast

Chow, B.C., McKenzie, T., & Louis, L. (2009). Physical activity and environmental influences during secondary school physical education. *Journal of Teaching in Physical Education, 28*, 21–27.

Darst, P., Cusimano, B., & van der Mars, H. (1993). Improving your instruction through self-evaluation: Part Two, Using class time effectively. *Strategies, 7*(3), 26–29.

Rink, J. (2003). Effective instruction in physical education. In S. Silverman and C. Ennis (Eds.), *Student learning in physical education: Applying research to enhance instruction* (2nd ed., pp. 165–186). Champaign, IL: Human Kinetics.

Silverman, S., Devillier, R., & Ramirez, T. (1991). The validity of Academic Learning Time-Physical Education (ALT-PE) as a process measure of achievement. *Research Quarterly for Exercise and Sport, 62*, 319–325.

Solmon, M. A. (2003). Student issues in physical education classes: Attitudes, cognition and motivation. In S. Silverman and C. Ennis (Eds.), *Student learning in physical education: Applying research to enhance instruction* (2nd ed., pp. 147–163). Champaign, IL: Human Kinetics.

Ward, J., Wilkinson, C., Graser, S. V., & Prusak, K. A. (2008). Effects of choice on student motivation and physical activity behavior in physical education. *Journal of Teaching in Physical Education, 27*, 385–398.