WHAT IS SATIC?

INTRODUCTION TO SATIC

As a teacher, how will you measure your effectiveness in the classroom? If you find your class not responding, how will you know what teaching behavior to change to increase class responsiveness? How will you assess your teaching behavior? Standing outside yourself and observing your teaching would be very helpful. A videotape of your teaching provides this opportunity, and if used properly, this technique will highlight some things to change, such as poor eye contact or a distracting mannerism. You might discover that you were talking in a monotone, or that you were asking too many yes/no questions. You would probably see a lot of things, but without a system for analysis you will find it very difficult to track patterns in your behavior, make useful generalizations about your teaching, and understand what you are doing. This is where SATIC is helpful.

SATIC is an instrument developed by Michael R. Abraham and Dorothy M. Schlitt* that provides a useful framework for monitoring certain teaching behaviors. When used properly, it can provide answers to questions such as: Who is doing most of the talking in the classroom? Does the teacher tend to praise his/her students or to criticize them? What kinds of questions does the teacher ask and in what order? Does the teacher tell students the answers or does she/he help the students to find their own answers?

The modified SATIC contains 14 codes of verbal behavior and 4 codes of non-verbals (see accompanying form). Six of the verbal behaviors are categorized as "initiating" and eight as "responding". To use the SATIC coding sheet, observe a class and mark the appropriate category every time the teacher engages in verbal behavior. Each coding sheet covers 15 minutes of class time (divided into 5-minute segments). When you have finished coding, total the marks in each category. A comparison of the totals for various categories or groups of categories should give you a good idea of the kinds of teaching behavior that were occurring.

For example, a SATIC coding sheet showing numerous marks in categories #11 and #12, but relatively few in categories #5 and #7, is probably assessing a teacher who recognizes the value of student questions, opinions, and actions. This teacher probably has excellent rapport with the class. The high frequency of marks in categories #11 and #12 shows the teacher is encouraging students to go deeper into the discussion and stimulating interest and growth. (In a more traditional class you will find many more marks in categories #1-#3b, the initiating behaviors.)

ASSESSING YOUR CLASSROOM INTERACTION PATTERNS

SATIC is meant to provide a means of assessment rather than of evaluation. It purports to make no judgments, but only to report on the types of interaction taking place in the classroom. It gives a view of what is happening—but leaves it to you to decide if that is what you want to have happening. You must decide what is effective or ineffective teaching behaviors and patterns based on your student goals and contemporary learning theories. When you examine a SATIC coding sheet it may seem as though certain values about teaching are implied. The instrument certainly has biases, but how you interpret the data is up to you and whoever else you involve in the process of improving your teaching.

Perhaps you believe that extended-answer questions (SATIC #4) are preferable to short-answer questions (SATIC #3b)? But a teacher who only asks extended-answer questions *may* be stimulating useless rambling or useless speculation when what the students really need is more information to meet the goals you have in mind. Does it seem evident that praise or confirmation (category #7) are better than rejection (category #5)? Sometimes they may be. But praising has been shown to be overrated as a teacher behavior (Brophy, 1981)and it can be very limiting for students if they learn that pleasing the teacher is an important priority. Such students may become dependent on the teacher and avoid learning to do things for themselves. If many students are coming to ask mechanical "How should I do this?" or "Is this correct?" questions of a teacher who shows a relatively high number of "confirms" (#7) on a SATIC analysis, then it might be recommended that the teacher try to reduce the number of "confirms" in the future. These examples show that the context of teaching is critical when you analyze your SATIC coding. What you should be looking for are the patterns you exhibit and the conditions under which you exhibit those patters.

SATIC CATEGORIES

INITIATING BEHAVIORS

#1. LECTURES OR GIVES DIRECTIONS: Extended teacher-initiated commentary. Make one mark every 15 seconds.

#2. MAKES STATEMENT OR ASKS RHETORICAL QUESTION: Teacher initiated statement that takes less than 15 seconds, or a question to which no answer is expected. Examples:
- a. Short sets of directions
- b. Does that make sense?
- c. Any questions?

#3a ASKS YES/NO QUESTION. Examples
- a. Can anyone tell me . . . ?
- b. Could . . . ?
- c. Would someone . . . ?
- d. Will . . . ?

#3b ASKS SHORT-ANSWER QUESTION: A question that requires a 1-2 word answer. Examples:
- a. What is 4 + 4?
- b. To what species do humans belong?
- c. What is the term for . . .?
- d. What is the weight of the cart?

#3c ASKS THOUGHT-PROVOKING SHORT-ANSWER QUESTION: Examples:
- a. What do you think will happen if . . .?
- b. Will the object sink, float, or remain the same?

#4. ASKS EXTENDED-ANSWER QUESTION: Examples:
- a. How do the experimental data support the idea that energy is conserved?
- b. How can you explain . . .?

RESPONDING BEHAVIORS:

#5. REJECTS STUDENT COMMENT, ANSWER, OR QUESTION: The teacher reacts negatively, indicating that a student answer is wrong, or the teacher cuts off or rejects a student response. Example:
- a. No, try that one again.

#6. ACKNOWLEDGES STUDENT COMMENT OR ANSWER: The teacher does not evaluate student's idea. Examples:
- a. O.K.
- b. All right.
- c. That's an interesting idea.

#7. CONFIRMS STUDENT COMMENT OR ANSWER: The teacher positively evaluates a student idea (praise). Examples:
- a. That's right.
- b. Good job!

#8. REPEATS STUDENT COMMENT: The teacher repeats the student response.

#9. CLARIFIES OR INTERPRETS WHAT STUDENT SAID: Use this category when the teacher re-words or interprets a student response.

#10. ANSWERS STUDENT QUESTION: Use this category for short answers. Category #1 should be used when response extends beyond 15 seconds.

#11. ASKS STUDENT TO CLARIFY OR ELABORATE: Use this category when the teacher asks a student to extend, repeat, or clarify a student response. Examples:
- a. Tell me more about that idea.
- b. What do you mean by that?
- c. Please explain your idea.

#12. USES STUDENT QUESTION OR IDEA: The teacher redirects a student's question or idea to the class. Examples:
- a. Carla said the water is moving into the egg. What evidence supports that idea?
- b. How could that (student's idea) be used to . . . ?

NON-VERBAL BEHAVIORS:

#13 INAPPROPRIATE WAIT-TIME I AND II: Make a check for each inappropriate occurrence.

#14 ANNOYING MANNERISMS: List and tally each occurrence. Examples:
- a. Um's and Uh's
- b. Excessive OK's
- c. Pacing
- d. Excessive waving of meter stick

Two blank categories (#16 and #17) are provided for you to list specific behaviors you would like to record. Examples:
- a. Teacher sarcasm
- b. Lack of effective monitoring

Ms. Reed's Class *Transcript of scenario #1*

Ms. Reed is the teacher in a ninth-grade physical science class on the second day of a laboratory project investigating pendulums. The pendulum equipment consists of a frame which allows for the adjustment of the lengths of up to three strings; several bobs of varying weights; an arc distance scale positioned so that the length of the pendulum swing can be measured; and a stop-watch. The laboratory assignment is to design and execute an experiment to discover the properties of pendulums. Ms. Reed is moving from one laboratory station to another.

Ms. Reed: Hi, Jeff, how's the lab going?[1]

Jeff: Okay, I guess, but I'm, having some trouble figuring out what questions to ask in my experiment.

Ms. Reed: Have you been able to think of any questions at all?[2]

Jeff: Not really.

Ms. Reed: Have you done anything at all with the equipment?[3]

Jeff: Well, a little. I swung two of the weights, two different ones, from strings the same length, and they went back and forth in about the same amount of time.

Ms. Reed: What question could you ask about that?[4]

Jeff: I could ask, "Why do they swing in the same amount of time?"

Ms. Reed: That sounds okay,[5] but a more complete way to say that is, "Why doesn't the bob weight, or mass, affect the frequency of the swing?"[6]

Jeff: Okay, but what do I do now?

Ms. Reed: I think you can figure that out by reviewing what you've done so far. Just try and go back to the point where you hadn't tried swinging the different weights. What question did you have in mind?[7]

Jeff: I'm not sure.

Ms. Reed: Just repeat what you did—get the different weights on the strings[8] . . . That's it[9]—now what are the possibilities you can think of?[10] . . . What's going to happen?[11]

Jeff: They're going to swing back and forth.

Ms. Reed: What else could happen? Anything you can think of.[12]

Jeff: Could they stop swinging at the bottom?

Ms. Reed: That's good.[13] Say as many possibilities as you can think of.[14]

Jeff: They could strop at the far side. They could just keep swinging. They could swing all the way over.

Ms. Reed: What about comparing the two?[15]

Jeff: Oh, they could swing at different speeds, or at the same speed. Or one could swing farther than the other, or more times.

Ms. Reed: Good.[16] Now, what was the first question?[17]

Jeff:	Why do they swing at about the same speed?
Ms. Reed:	And what did you have to know first in order to ask that question.[18]
Jeff:	That they do swing at the same speed.
Ms. Reed:	So what question did you ask?[19]
Jeff:	Will they swing at the same speed? I get it—I already did ask a question and got an answer.
Ms. Reed:	That's right.[20] See how questions are part of just playing around?[21] Now, how could you tell that they swung with the same frequency?[22]
Jeff:	Just from watching?
Ms. Reed:	How small a difference in frequency do you think you can detect by watching?[23]
Jeff:	Not a very small one.
Ms. Reed:	Well, I think you can go on by yourself to be more certain that differently weighted pendulums of identical length may have the same frequency of swing. Come and get me if you have a question,[24] unless you have one now?[25]
Jeff:	Well, I can see how to test the question of whether the weights move at the same frequency—but I' not sure how to answer *why* they do.
Ms. Reed:	What kind of answers do you—does anyone—get from "why" questions?[26]
Jeff:	"Because" answers.
Ms. Reed:	So look for *causes*. The swing is the effect.[27]

Check your coding for part one against the coding on the following page, then move on to part two of the transcript.

Ms. Reed's Class *Coding of scenario #1*

1 Code #3. A greeting (or other non-lesson-related behavior) does not have to be coded. For instance, you would not necessarily have to code "Hi, Jeff, how are you doing today?" But some non-lesson-related comments, such as "Keep quiet!", are valuable to code because they are related to behavior problems.

2 Code #9. The question may appear to be a #3, but Ms. Reed is responding to Jeff's comment and trying to determine what he means by "having some trouble."

3 Code #3.

4 Code #3. Normally, asking a student to formulate a question is a #4 because such formulation is difficult—it is not simply a recall skill. But in this case Jeff can simply insert a question word ("why", "how," "when," etc.) without giving it much thought.

5 Code #6.

6 Code #9. Ms. Reed has put together several things Jeff has said. (She might have pointed this out instead of making it sound as though Jeff had done a poor job of formulating his question.)

7 Code #10.

8 Code #2.

9 Code #7.

10 Code #4.

11 No code—essentially a restatement of question 10.

12 Code #11.

13 Code #7.

14 Code #11.

15 Code #11. She is still pushing Jeff to give her an answer to question 7.

16 Code #7.

17 Code #3.

18 Code #3.

19 Code #3.

20 Code #7.

21 Code #2. Rhetorical question.

22 Code #3.

23 Code #3.

24 Code #1.

25 Code #3.

26 Code #3.

27 Code #2.

Go on to part two of Ms. Reed's class on the following page.

Ms. Reed's Class *Transcript of scenario #2*

Jeff: Ms. Reed, I'm sure that the weight on the end doesn't have very much effect on the length of time of the swing. I timed several different things. First I timed ten swings of one and then ten swings at a different weight . . .

Ms. Reed: Good[28]—you saw how to increase the accuracy of your measurement.[29]

Jeff: And then I started the pendulums at different heights, you know, so that the length of the swings could be different—and the time for ten swings is always just about the same, no matter how high you start it from, for a certain length of string!

Ms. Reed: It sounds like that's not the answer you expected.[30]

Jeff: Well, I know that pendulums are used in clocks, so it makes sense that they would always take the same time for each swing—but I still don't know why exactly. Wouldn't the pendulum move more slowly if it was swinging in a smaller arc?

Ms. Reed: Now you're implying that the speed of pendulums of the same weight and string length may vary according to the starting height, yet you've found that no matter what the starting height is, the time interval or frequency for one swing remains constant.[31] How could this be?[32]

Jeff: I'm not sure.

Ms. Reed: Okay, let's look at what the pendulum does. Hold one of the pendulums up—what's happening now?[33]

Jeff: It's still.

Ms. Reed: And as it starts to fall or swing what happens to it?[34]

Jeff: It's going faster.

Ms. Reed: Where does it start to slow down?[35]

Jeff: At the bottom.

Ms. Reed: Go on—describe the rest.[36]

Jeff: Well, it starts slowing down and it stops at almost the same place it started, but on the other side, and then it swings back toward the bottom.

Ms. Reed: So first it speeds up and then when it gets to the bottom it starts to slow down.[37] When is the speed the greatest?[38]

Jeff: At the bottom.

Ms. Reed: What force is causing the changes in speed?[39]

Jeff: The force of gravity on the pendulum.

Ms. Reed: Is the force of gravity on the pendulum bob, is the amount of pull on the pendulum, constant?[40]

Jeff: I think so.

Ms. Reed: Well, at these distances from the earth, it is essentially constant.[41] You understand what I mean?[42]

Jeff: Yes.

Ms. Reed: Okay.[43] So the force is constant but the maximum speed changes with the starting height—yet the time interval for one swing remains constant if the string length is the same, no matter what the weight or the starting height.[44] That's what we've got so far, right?[45]

Jeff: Right.

Ms. Reed: So what doesn't make sense?[46]

Jeff: That the maximum speed could change, but not the time interval. . . But no, wait a minute, the starting height changes the distance, the length of the swing!

Ms. Reed: Now you're getting somewhere.[47] What does that mean about the relationship of the distance traveled an the maximum speed?[48]

Jeff: Well, the pendulum that starts higher swings just enough faster to travel the larger distance in the same amount of time.

Ms. Reed: Okay.[49]

This ends part two of the transcript of Ms. Reed's class. Check your coding with those on the next page; then you can go on to part three of the transcript.

Ms. Reed's Class *Coding of scenario #2*

28 Code #7.

29 Code #9.

30 Code #9.

31 Code #9.

32 Code #12. Here and in 31 Ms. Reed has been trying to clarify Jeff's question to see if he can answer it himself.

33 Code #3.

34 Code #3.

35 Code #3.

36 Code #3. This is equivalent to the question, "What else happened?"

37 Code #8.

38 Code #3.

39 Code #3.

40 Code #3.

41 Code #2.

42 Code #3. If Ms. Reed asked many questions of this sort it would be good to create a separate category for them.

43 Code #6.

44 Code #1. This is difficult to code because Ms. Reed is summing up what they've discovered together; but since Jeff hasn't said much recently, it is mostly a summation of her own statements.

45 Code #3.

46 Code #3. This might be a #4, but they've gone over it too much for the question to take much further thought.

47 Code #7.

48 Code #4.

49 Code #6.

Go on to part three of the transcript.

Ms. Reed's Class *Transcript of scenario # 3*

Ms. Reed: Okay, what questions have you answered so far?[50]

Jeff: Well, I figured out what keeps the time interval the same for different starting heights.

Ms. Reed: And what was the original question?[51]

Jeff: Why do differently weighted pendulums swing at the same speed?

Ms. Reed: Well, from the discussion we just had, don't you think we ought to be careful about using the term "speed"?[52]

Jeff: You mean we should say "velocity"?

Ms. Reed: No.[53]

Jeff: . . . Oh—you mean time. Because the speed changes in different parts of the swing, but the amount of time of the swing stays the same.

Ms. Reed: Yes.[54] Now, you said before that the pendulum swings to almost the same height on the other side—why *almost*?[55]

Jeff: Because of the air—the wind resistance.

Ms. Reed: Okay,[56] but how about in a vacuum?[57]

Jeff: Well . . . I still think it would slow down.

Ms. Reed: Why?[58]

Jeff: Because things always slow down.

Ms. Reed: But more specifically, why would it slow down?[59]

Jeff: I'm not sure.

Ms. Reed: Okay,[60] examine the pendulum apparatus. Tell me everything you can about it.[61]

Jeff: Everything?

Ms. Reed: Well, describe its parts.[62]

Jeff: Okay, there's the bob, the string, the frame, the scale, the—.

Ms. Reed: No,[63] *describe*, tell me what happens to each part when the pendulum moves.[64]

Jeff: Oh, okay, Well, the weight goes back and forth, and the string does too, and the frame just sits there.

Ms. Reed: What happens between those parts?[65]

Jeff: Well, the bob hangs on the string and maybe it stretches it some, and the string hangs from the frame and pulls on it.

Ms. Reed: How might these relationships between the parts affect things?[66]

Jeff: Well . . . I guess there's some friction between the string and the frame, and that slows the pendulum down.

Ms. Reed: Okay, to get rid of wind resistance we put the pendulum in a vacuum. How do we get rid of the friction in that pivot?[67]

Jeff: . . . I don't know.

Ms. Reed: . . . Hmmm. I'm not certain either.[68] If you figure it out or get any ideas, let me know.[69]

Jeff: Okay.

This is the end of the transcript of Ms. Reed's class. You can check your coding with that on the following page.

Ms. Reed's Class

Part Three: Coding

50 Code #3.

51 Code #3.

52 Code #11.

53 Code #5.

54 Code #7.

55 Code #11.

56 Code #6.

57 Code #11. She's working to clarify Jeff's statement.

58 Code #11.

59 Code #11.

60 Code #6. This may be an acceptance of Jeff's statement or it may be a filler which we need not code.

61 Code #3.

62 Code #10.

63 Code #5.

64 Code #2. She is clarifying her own question rather than introducing a new question.

65 Code #4. Ms. Reed is asking for a description of the interaction of parts, and this is a new framework for this discussion.

66 Code #4.

67 Code #4.

68 Code #2.

69 Code #2. Some statements of this sort are best coded as questions; but this one seems to be only an announcement that the conversation is over.

After you have computed Ms. Reed's Interaction Index on your coding sheet, you can compare your completed coding sheet with that on the following page. Then you can look at the interpretation of Ms. Reed's SATIC coding