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Tasha Becomes a Learner

Helping Students Develop Confidence and Independence

Candace Chick

When we think about students who struggle to learn mathematics, we often focus on the skills and concepts they haven't mastered. Although it is important to assess what mathematical knowledge students need to learn, it is also critical to assess students' learning behaviors—their attitudes and actions that indicate how they approach learning. Development of these behaviors is key to students' ability to take in new information and access what they already know. Students who manifest these behaviors take an active role in their learning; they approach their work independently and confidently. My role with students who are struggling is to document how they approach learning and introduce strategies that will help them develop positive learning behaviors.

The Learning Behavior Observation Record

I have found that unless my struggling students begin to see themselves as confident, independent thinkers, their progress in learning mathematics will be limited. One tool I have used to guide my work with these students is the Learning Behavior Observation Record (see Figure 20–1). This tool was developed by teachers and researchers in the Accessible Mathematics project and represents a list of the behaviors they found to be significant indicators of student success in mathematics. The tool gave me a way to think about these specific behaviors instead of generalities such as “learned helplessness” that don't provide a starting point to help students.

The marks along each line are meant to help keep track of a student's progress over time. Because the record presents the development of these behaviors as a continuum, it is an extremely helpful tool for documenting students' current status, tracking their progress, and identifying specific goals for improvement. I find that it is sometimes useful to share this tool with the students themselves and with

TAKING RESPONSIBILITY FOR LEARNING

Sees oneself as a learner
Is willing to take risks
Perseveres
Knows when to ask for help
Able to work independently when expected
Actively participates in mathematical discussions
Listens to ideas of others
Tries to understand what problem is asking
Makes connections to prior knowledge
Applies new knowledge to a variety of contexts
Evaluates own work and compares to others' solutions
Checks reasonableness of answers
Uses organization to facilitate thinking and solve problems

Figure 20-1. The record has blank lines on the bottom because the list may be expanded, according to the needs of each child.

parents, as it illustrates what I am talking about, and it can provide a jumping-off point to talk about where students have improved and where they still need to demonstrate progress.

In addition to thinking about whether a student is exhibiting these behaviors and how often, noting the context in which a student exhibits the behaviors can also provide valuable insight. For example, there are many factors that might affect a student's willingness to take risks. When I notice that a student is occasionally willing to take risks, I make note of the learning context in which this happens. Was it during a whole-group discussion or during small-group or independent work? What was the mathematical focus of the problem (i.e., number, geometry, data)? Was it a problem-solving situation or a computation problem? Similarly, if a student is making connections to prior knowledge, I consider the context of the lesson. How was the lesson introduced? Were explicit connections to prior knowledge made? What is the mathematical content of the lesson? Might the context be particularly applicable to that student? These kinds of questions are extremely helpful in understanding more about how a particular student learns.

NOTE:

In this *My Kids Can* chapter, Candace Chick shares the progression of one of her students, Tasha. Tasha entered an inclusion class in fourth grade, after spending her first three years in a special education class for children with behavior problems. Figure 20–2 is Tasha's Observation Record representing where she was on the continuum in October of her fourth-grade year and in the spring of her fifth-grade year. (Candace "looped" or stayed with her students in both fourth and fifth grades.) In this chapter, she focused on how Tasha presented herself initially, the strategies she used, and the progress Tasha achieved, Candace selected a few of the learning behavior categories to discuss this article.

For the purpose of this course, we will look at one of learning behaviors - Actively Participates in Mathematical Discussions. The complete chapter includes the following learning behaviors:

Sees Oneself as a Learner

Checks Reasonableness of Answers

Actively Participates in Mathematical Discussions

Makes Connections to Prior Knowledge

Uses Organization to Facilitate Thinking and Solve Problems

TAKING RESPONSIBILITY FOR LEARNING

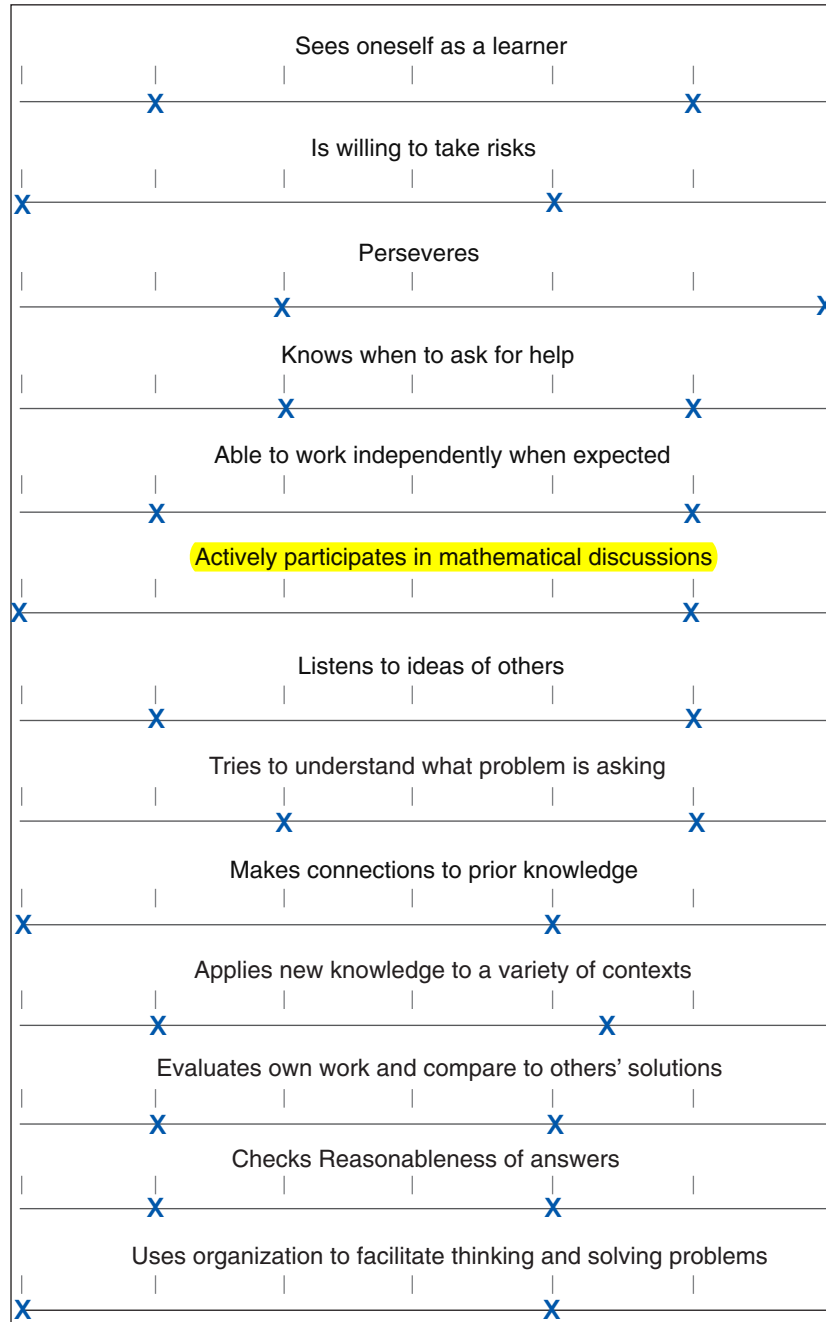


Figure 20–2. Tasha’s Learning Behavior Observation Record representing where she was on the continuum on October of her fourth-grade year (X’s on left of the lines) and in the spring of her fifth-grade year (X’s on the Right of the lines).

Actively Participates in Mathematical Discussions

I used a variety of specific strategies to encourage Tasha’s participation in discussions and help build her confidence. I asked her questions in the large group that I knew she could answer (e.g., what is another fraction for $\frac{1}{2}$?). I also did some “preteaching”—going over directions and activities in advance so she would be

My number is odd.
My number is a multiple of 9.
My number is a square number.
My number has two digits.

Figure 20–3.

able to participate in the group. This was particularly effective with Guess My Number Puzzles (Tierney et al. 2004; see Figure 20–3). Students who struggle with mathematics often have problems developing a strategy to figure out these puzzles. They tend to guess at numbers that work for only one or two of the clues. For example, when I presented the puzzle in Figure 20–3, Tasha started out by calling out square numbers randomly. I knew I needed to help Tasha approach this problem more systematically, so I started out by posing simpler puzzles with a smaller range of numbers or fewer clues (see Figure 20–4). Having a smaller range helped her focus on the possibilities.

Additional strategies I used to help Tasha solve the number puzzles included:

- making clear that the number must fit all the clues
- explicitly showing what “process of elimination” means
- offering 300 charts, scrap paper, and calculators for skip counting
- helping her find ways to keep track of the numbers to help her develop a method for eliminating the ones that don’t fit the clue
- showing her how to use the 300 chart to circle all the multiples of 9 between 50 and 100

My number is smaller than 50.
It is a square number.
It is a multiple of 5.

Figure 20–4.

- discussing possible order of clues that narrow the search quickly (for example, after recognizing the range, is it more efficient to list all the odd numbers or list the multiples of 9 or the square numbers?)
- reviewing definitions of words such as multiple, factor, prime, even, square numbers
- providing supplemental work with multiples, factors, and squares

Gradually, Tasha began to participate in discussions and was often able to supply reasonable answers using some of the strategies listed above. As she experienced more success, she gained confidence and began attempting to explain her mathematical work, which in turn built her understanding of mathematics.

Reflections

Students arrive in my classroom with a variety of prior experiences that influence how they see themselves as learners of mathematics. The Learning Behavior Observation Record provided a framework for me to think about the characteristics of my students as mathematics learners and how these behaviors evolved over time along the different dimensions. It was particularly helpful in working with a student like Tasha, whose needs seemed overwhelming at first. By thinking about each of the dimensions on the chart, I was able to focus on specific characteristics and keep track of how she was doing over time and in different contexts. At first, I filled out Tasha's chart before and after each curriculum unit. In fifth grade, when I knew her better and had a built-in sense of how things were going, I tended to fill it out at the end of each term, as I tried to do for my other students. I worked hard on helping Tasha see herself as a learner, building her confidence, and helping her use what she knew. I thought carefully about the strategies with which Tasha was fluent, and I used those as a starting place to develop more efficient strategies. Toward the end of fifth grade, when I saw her volunteering to present her work and sharing strategies that she understood, I realized she had come a long way, and I felt optimistic about her future as a learner of mathematics.

The reading is an excerpt from *My Kids Can: Making Math Accessible to All Learners* (Chapter 20 Tasha Becomes a Learner) Heinemann, 2011