Strength in Numbers: Collaborative Learning in Secondary Mathematics

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Status versus Ability: Interrupting Ideas about Smartness

If learning is not the same as achievement, and if achievement gaps often reflect opportunity gaps, what do we make of students' prior achievement when they enter our classrooms? Who are the students who have succeeded in mathematics before entering our classrooms? How about those who have not? Disentangling achievement and ability may sound reasonable, but we need a new model for thinking about students we teach. Elizabeth Cohen's (1994) work on complex instruction frames these issues around *status,* a concept that clarifies the conflation of achievement and ability. *Status* gives teachers room to analyze this problem and respond through their instruction.

In this context, we will use the following definition of status:

> ***Status is the perception of students' academic capability and social desirability.***

The word *perception* is key to this definition. Perception drives the wedge between social realities and perhaps yet unrealized possibilities of what students can do mathematically. Perception involves our expectations of what people have to offer.

Where do these status perceptions come from? As the chapter opener discusses, the perception of academic capability often comes from students' earlier academic performance. It might come from their academic track, with *honors* students having higher status than that of *regular* students. Status judgments about ability might also draw on stereotypes based on class, race, ethnicity, language, or gender.

The perception of social desirability arises from students' experiences with peers. For instance, students often see attractive peers as desirable friends—or perhaps just undesirable enemies. Likewise, whatever drives popularity in local teen culture will show up in the classroom as status. The team captain, the talented artist, or the cut-up rebel—whomever students clamor to befriend or win the approval of—will have higher social status.

> **"Thinking about status issues is what, for me, differentiates complex instruction from just 'regular' group work. Addressing and being aware of status issues is what makes all the other interactions productively possible."**
>
> ***—Clint Chan, Mathematics Teacher***

Status plays out in classroom interactions. Students with high status have their ideas heard, have their questions answered, and are endowed with the social latitude to dominate a discussion. On the other side, students with low status often have their ideas ignored, have their questions disregarded, and often fall into patterns of nonparticipation or, worse, marginalization.

Recognizing the relationship between status and speaking rights highlights an important way for educators to uncover these issues in their classrooms. Status manifests through participation patterns. Who speaks, who stays silent, who is excluded, and who dominates class discussions are all indicators of status. Individually, this concept influences students' learning. If some students' ideas are continually ignored, their questions will go unanswered and their confusions will remain unaired. Over time, this system may reinforce negative ideas they have about themselves as mathematics learners, because they may conclude that their ideas are not valuable. Conversely, students whose ideas are consistently heard and worked with will have greater opportunities to engage and sort through them. Socially, if students' dominance becomes unregulated, they may develop an overblown sense of their value in the social and intellectual world of the classroom. Thus, status-driven interactions not only influence learning but also reinforce existing status hierarchies.

Skeptics might protest linking participation and status. "Some students are just shy," someone might say. That is true. Likewise, students learning English often go through a silent period or may be self-conscious of their accents. Our goal with reluctant speakers is to design ways for them to comfortably participate more than they are perhaps naturally inclined to do. As we will cover in chapter 5, strategies such as small-group talk first or individual think time may help build the confidence of shy or nervous speakers. The emphasis on participation in classroom discussions comes from several research studies showing that such involvement is essential to developing conceptual understanding and academic language (Cohen et al. 2002; Webb 1991).

Socially, status plays out in participation patterns. Individually, status influences students' mathematical self-concepts, or their ideas about what kind of math learners they are. As mathematics educators, we have all encountered students who claim that they are not "good at mathematics" before they even give a new idea a chance. Intuitively, we know that students' mathematical self-concept influences their motivation and effort in mathematical learning. If students *know* they are not good at mathematics, why should they push past their confusion when problems become difficult? If students *know* they are smart, why should they bother to explain their thinking, let alone pay attention to a classmate's? Students' self-concept is deeply tied to their attitudes about learning mathematics, in and out of our classrooms. Societal biases predispose students to think of themselves and their peers as more or less competent in mathematics, playing into students' choices to engage, persist, and take risks in the classroom.

"My students and I talk a lot about what it looks like to be a powerful math learner—taking risks, contributing productively, and persisting. I've started making those behaviors transparent to students when they happen. We talk about how brains learn and how they should expect to move from surface knowledge to confusion to deeper understanding. I want them to experience that journey whenever I ask them to do tough math together (group work). I know group work is working when they take risks, contribute, and persist. It bleeds into whole-class discussions, too."

—Laura Evans, Complex Instruction Educator, Mathematics Teacher, and Coach

Seeing Status in the Classroom

Status hierarchies manifest in classroom conversations and participation patterns, often leading to *status problems,* or the breakdown of mathematical communication based on status rather than the substance of mathematical thinking. Before we talk about remediating status problems, let's delineate how teachers can see status problems in their classrooms.

Participation

One of the most important and tangible status assessments teachers can do is ask who speaks and who is silent. Some students might dominate a conversation, never soliciting or listening to others' ideas. These are probably high-status students. Some students may make bids to speak that get steamrolled or ignored. Some students may seem to simply disappear when a classroom conversation gains momentum. These are probably low-status students.

If you want to get a better handle on the participation patterns in your classroom, give a colleague a copy of your seating chart and have this person sit in your classroom. He or she can check off who speaks during a class session. This simple counting of speaking turns (without worrying about content or length for the moment) can give you a sense of dominance and silence. Surprisingly, teachers' impressions of speaking turns are sometimes not accurate, so this exercise can help sort out participation patterns. I have seen this in my own work with teachers and in earlier research. Dale Spender (1982) videotaped teachers in high school classrooms, many of whom were "consciously trying to combat sexism" by calling on girls and boys equally. Upon

reviewing the tapes and tallying the distribution of participation, the teachers were surprised that their perceived "overcorrection" of the unequal attention had only amounted to calling on the girls 35 percent of the time. The teachers reported that "giving the girls 35 percent of our time can feel as if we are being unfair to the boys." Although (we hope) the gender ratios in this research may be dated, the phenomenon of teacher misperception still holds. (For more on working with colleagues, see chapter 7.)

Teachers attending to participation patterns can use certain moves to encourage silent students to speak. For example, teachers might introduce a question with "Let's hear from somebody who hasn't spoken today." High-status students sometimes assert their standing by shooting their hands up when questions are posed, letting everybody know how quickly they know the answer. To get around this, teachers can pose a difficult question prefaced with the instructions, "No hands, just minds. I want all of you to think about this for the next minute. Look up at me when you think you know and I will call on somebody." By allowing thinking time, teachers value thoughtfulness over speed and have more opportunity to broaden participation. Eye contact between students and teacher is a subtle cue and will not disrupt others' thinking in the way that eagerly waving hands often do. Finally, teachers can make clear that they value partial answers as well as complete ones. When posing tough questions, they can say, "Even if you only have a little idea, tell us so we can have a starting place. It doesn't need to be all worked out."

Listening

Part of effective participation in classroom conversations requires listening and being heard. As a follow-up to an initial assessment of participation patterns, having an observer pay attention to *failed* bids for attention or to ideas that get dropped during a conversation might be useful.

Of course, part of the complexity of teaching is deciding which ideas to pursue and which ideas to table. But the choice of whether to entertain students' thinking communicates something to them about the value of their ideas, which ties directly to status. Students whose ideas are consistently taken up will have one impression about the value of their ideas; students whose ideas are consistently put off will have another idea entirely.

Teachers can model listening practices during class discussions, directing students to listen to each other. By showing students that rough-draft thinking—emergent, incompletely articulated ideas—is normal, teachers can help develop a set of clarifying questions that they ask students, and eventually, that students ask each other. For example, a teacher might say, "I'm not sure I follow. Could you please show me what you mean?" Saying this makes confusion a normal part of learning and communicates an expectation that students can demonstrate their thinking.

Body Language

During class, where are students focused? Are they looking at the clock or at the work on the table? Students who have their heads on the desk, hoodies pulled over their faces, or arms crossed while they gaze out a window are signaling nonparticipation. In small-group conversations, their chairs may be pulled back or their bodies turned away from the group. Body language can tell teachers a lot about students' engagement in a conversation.

Teachers' expectations for participation can include expectations about how students sit. "I want to see your eyes on your work, your bodies turned to your tables."

Organization of Materials and Resources

If students cannot see a shared problem during group work or put their hands on manipulatives, they cannot participate. If fat binders or mountains of backpacks obstruct their views of shared materials, they cannot participate. As with body language, teachers can make their expectation for the organization of materials explicit. "No binders or backpacks on your desks. All hands on the manipulatives."

Inflated Talk about Self or Others

Certain phrases or attitudes can be defeating and signal status problems. Adolescents often engage in teasing insults with each other, but such talk might become problematic in the classroom. Scrutinize judgments about other students' intelligence or the worthiness of their contributions. The statement "You always say such dumb things!" signals a status problem. "Gah! Why do you always do that?" might be more ambiguous. Teachers need to listen carefully and send clear messages about the importance of students treating each other with respect. "We disagree with ideas, not people" might be a helpful way to communicate this value.

Negative self-talk can be just as harmful. It not only reinforces students' impressions of themselves but also broadcasts these to others. "I'm so bad at math!" should be banned in the classroom. Give students other ways to express frustration: "I don't get this yet." The word *yet* is crucial because it communicates to students that their current level of understanding is not their endpoint. In fact, several teachers I know post *YET* on their walls so that any time a student makes a claim about not being able to do something, the teacher simply gestures to the word *YET* to reinforce the expectation that they will learn it eventually.

The converse of the negative self-talk issue also exists. If a student defends an idea only on the basis of his or her high status, this is a problem. Arguments should rest on mathematical justification, not social position. "Come on! Listen to me, I got an A on the last test" is not a valid warrant and should not be treated as one. By emphasizing the need for "becauses" or "statements and reasons" in mathematical discussions, teachers can winnow away arguments that rest on status.

The Opposite of Status Problems: Equal-Status Interactions

If students arrive in the classroom with expectations about whose contributions are worth listening to, they will act accordingly. They will solicit information and attend to the questions of high-status students. From a certain perspective, this *limited-exchange model* is an efficient way to get work done: go to the person who will have the information you need to complete the task.

In contrast, an *equal-exchange model* for working together serves different purposes, supporting all group members' engagement in higher-order thinking. Instead of a divide-and-conquer strategy with a goal of efficiency, equal exchanges involve deliberation and consideration of multiple perspectives with a goal of deeper understanding. When teachers want students to engage in conceptual learning and students are given a cognitively rich task, an equal-exchange model of interaction is vital.

Many teachers build in the expectation that students will learn to engage equitably even when students are engaged in less complex tasks. Teaching with the expectation that "no one is done until everyone is done" allows for this. Students begin to take responsibility for their own learning, as well as the need to support the learning of others in their group.

The first teaching challenge is to support students in shifting from limited to equal exchanges when they are working with rich mathematical tasks. Students need a purpose for soliciting the ideas of peers whom they may not expect to have worthwhile contributions. Teachers can cultivate equal-exchange or equal-status interactions in small groups by using two main strategies: structuring activities that necessitate group input (see chapter 4) and reworking students' assumptions about whose contributions are worthwhile. This latter strategy is the focus of this chapter.

In equal-status interactions, low-status students' participation and influence is not strongly distinguishable from that of their higher-status peers. Researchers Elizabeth Cohen and Rachel Lotan found that teachers' use of status treatments (see the Status Interventions section later) positively related to increased participation and influence of low-status students. Likewise, at the classroom level, the more teachers used status treatments, the less participation and influence were bound up in students' status (Cohen and Lotan 1995). In other words, equal-status interactions are the foundation of productive mathematical conversations.

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