Student Grouping That Enhances Learning

Student grouping for mathematics instruction is an area that has received widespread attention in recent years. Some educators believe that homogeneous (ability) grouping is a way to ensure that students obtain specific experiences and skills needed to move their thinking forward. Others feel that heterogeneous grouping offers students a chance to share their thinking across ability levels and therefore leads to increased understanding of concepts and topics for all students. In either case, educators must consider the intersection of mathematical content, student ability, and experiences when grouping students for mathematics instruction. They need to think about student grouping flexibly according to the demands of the task.

Kellie Sullivan describes her thinking about student grouping for a Math Workshop on multiplication. She bases her decisions on her students' unique mathematical and social contributions, personality, and disposition.

As I considered my students and thought about where they were in developing strategies for multiplication, I decided to partner them deliberately and have the partners remain together for the entire Math Workshop. Although I sometimes hear teachers talk about this sort of partnering as a form of ability grouping, I was thinking more of partnerships that would stimulate thinking and forward movement for each and every student. I thought about where students' thinking was at the moment, what sort of nudge I felt they needed to move forward, and which classmates might provide that opportunity.

As I introduced the activities to my students, I was quite explicit about the reasons for the partners. I said:

This Math Workshop will last several days, and I have chosen a partner for you who I think will help you learn in a certain way. Your partner may be someone who is thinking in the same way you are, so you can solve the problems together and help each other. Or your partner may be someone who thinks a bit differently and can show you a new and interesting way to solve the problems. Either way, your partner will help you learn.

For example, one of the partnerships that I formed was between Dan and Kalina, partly because they get along well together. While Kalina can be challenging for others to work with, her math skills are strong, and she is confident with multiplication cluster problems and thinking her way through them. Dan, on the other hand, often gets stuck and doesn't know how to start. He has the social skills to deal with Kalina's prickly personality, and she has the clarity of thinking to help Dan move forward mathematically.

I partnered Lesa and Nathan because Lesa was quite articulate and confident about strategies she had developed while working with our remedial math teacher, Ms. Richmond. Nathan needed to become more flexible in his strategies and more articulate about them. They were working on similar strategies, but I felt Lesa might help Nathan develop more flexibility, while she would benefit from the need to explain to him. Because they both liked to write, I expected they would enjoy developing their written explanations together. In addition, Lesa is able to stay on task during open-ended activities, and Nathan needs support to stay focused.

Chase and Jillian, both strong math thinkers, were partners. Chase has a difficult time explaining his thinking clearly and completely, while Jillian is comfortable sticking with writing her explanations until they are complete. I thought she would be challenged trying to understand his thinking, while he might progress in being able to explain his thinking.

Jamal and Tarana are two strong students whom I paired together. Both of them use the standard algorithm. Although they are usually successful in solving problems and both insisted they "like this way the best," I was convinced they were capable of thinking much more deeply and flexibly. I was concerned that they were not flexible in approaching problems and that they did not always look at the problem as a whole before trying to solve it. I also knew they could deepen their understanding of multiplication by trying some other methods. As I handed out their folders, I specifically addressed this issue privately with them:

I'm having you be partners because I want you to work together to figure out other good ways to solve these problems. I know you can both do them that way, but sometimes there are other efficient ways to solve this kind of problem. I want you to find them.

Interestingly, they both grinned and looked as if they meant to rise to the challenge.

Matt and Spencer both often have unconventional but mathematically sound ways to solve problems. They also both tend to make careless errors and arrive at incorrect answers. As they began to work, I addressed this issue with them:

I have put you together because you are both really good math thinkers, but you often get the wrong answer. I want you to check each other carefully. Make sure you understand each other's methods, and that you have the correct answer at the end.

As I watched all of the partners set to work, I was pleased with the energy and cooperation that was evident in the room. Each partnership had complementary skills that were helping them stay focused, get into the problems, and move along. Each evening I collected the folders and went through them, noting work completed and, especially, strategies used. Each new day, I gave specific instructions about my expectations to each set of partners. I made up a set of challenge problems for some groups of students whom I felt needed to extend their thinking.

However, I began to worry a bit about a couple of students, including Dan. Dan's written work did not indicate that he was able to solve the cluster problems independently, and I wondered if his partnership was really helping him as I had hoped. Dan had completed very little work, and, at one point, I observed his partner, Kalina, standing by Dan's desk and coaching him about what to write on his paper. This, combined with the fact that he did not include a written explanation with any of his work, made me wonder if he had just copied the answers from Kalina. The next day, I decided

to regroup a few partners so I could work individually with Dan and some other students. As we sat at the back table, I was relieved to discover that Dan understood more than his written work indicated. He was solving the problem 6×50. When I asked him, "Can you tell me how you got these answers?" he easily responded with mathematically accurate and sensible explanations. I then said, "Write that down just the way you said it." Dan wrote:

I knew 3 x 50 = 150. Six is the doble [double] of 3, so I doubled the 150 to get 300.

As I reviewed the work of the remaining partners, I saw the growth I had been hoping for.

- Chase, with Jillian's support, had been able to write explanations for all of his problems, which he had been unable to do before.
- Lesa and Nathan, too, had finished all the pages and had time to play a game. Their work was complete, organized, and accurate.
- I smiled to note that Spencer and Matt had completed a good deal of work and, although I had asked them to correct a few things, for the most part their answers were clear and accurate.
- Although Tarana had been absent for part of the Math Workshop, she and Jamal had completed a good deal of work. Jamal, when given the chance to substitute challenge problems for the required work, moved ahead a good deal. He worked with sustained interest on the problems I had made up for him, figuring each one out before checking it with great pleasure on the calculator. He was demonstrating the flexibility that I had hoped he would develop in his strategies, even with very difficult problems.

As I thought back about the Math Workshop we had finished, I realized my own thinking about the purpose of the activities had evolved as well. I used to think Math Workshop was for practicing skills and strategies. This time, however, I had specifically identified places where each student needed to grow. I had chosen partners based on my assessment of all students. I thought about students who would inspire other students in their mathematical development, and I told students what I expected of their partnerships. Given those expectations and my own clarity about mathematical growth instead of just rote practice, I believe that my students accomplished more during those three days than might have otherwise been the case.

Cooperative grouping in mathematics can be an important strategy for enhancing learning, but all too often cooperative groups are formed without careful attention to the ways in which students might support each other's mathematical thinking. Grouping is sometimes done strictly according to mathematical ability or to create a mix of students in terms of gender, race and ethnicity, and language preferences. Sometimes groups are self-chosen so that many students consistently work with the same individuals.

Ms. Sullivan illustrates a more complex way of thinking about student groupings that takes into consideration students' mathematical abilities, as well as their personalities and her own mathematical goals for each student. Ms. Sullivan makes her expectations clear for students, reviews the purpose of the partnerships, provides regular check-ins, and alters pairings when they appear not to meet her expectations. Her approach provides students with numerous opportunities to work in a variety of thoughtfully chosen groupings.

Questions for Discussion

1. **What factors about her students did Ms. Sullivan take into account as she planned how to group them?**
2. **Why do you think she chose to make her decisions explicit to her students? Do you agree with this decision?**
3. **In what ways do you use flexible grouping to meet the needs of the students in your classroom? What factors do you take into account as you plan your groups?**