Supporting Students with Disabilities During Group Activities: Five Tools Every Inclusive Mathematics Educator Needs

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Abstract

Students with disabilities are increasingly taught in general education settings, including mathematics classes. Too often, math teachers confront challenging behaviors of students with disabilities in inclusive settings. The authors present five efficient tools effective teachers can add to their repertoire to combat problem behaviors during group work that impact learning for students with problem behavior. In order to lead our students to proficiency in the concepts and procedures of mathematics, it is imperative that we have the behavior management skills to support our students in less structured environments like group work activities. In this article we highlight five research-based strategies that can be used to support some of the most challenging behaviors present in inclusive classrooms. Those five tools are assigning student to roles in group work, using proximity control with redirecting (directing student to be on-task), engaging students by using interest boosting techniques, conducting frequent checks for understanding, and delivering behavior-specific praise.

Keywords: group work, mathematics, students with disabilities, inclusion

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In the 2013 - 2014 school year, the number of students receiving special education services in the United States was 6.5 million (NCES, 2015), with 61.1% of all students with disabilities (SWD) spending at least 80% of their time inside general education classrooms. When SWDs enter general education mathematics classes, their teachers often report SWDs struggle with concepts being introduced and present instructional challenges (Grumbine & Alden 2006). Although different categories of disabilities impact students who are placed in general education settings, commonalities across categories can impede mathematics learning (*Heiman & Precel, 2003).* Group activities have assumed a central in-class role in developing conceptual understanding, yet group activities can also incubate misunderstandings, particularly for SWDs. During group activities SWDs can fall off pace from their peers preventing them from understanding critical concepts needed to solve problems thus developing misconceptions about those concepts. For example, students might confuse algorithms when multiplying fractions with those for adding fractions because they were off-task during the group activity. The off-task student, for example,

might see the generation of a common denominator as a first step in any work with fractions, even though multiplication of fractions is not necessarily facilitated with one. Similarly, the student who masters solving proportions through cross multiplication and is distracted during discussion of critical features may overgeneralize to addition of fractions because the set-up looks the same ($\frac{1}{2}+\frac{2}{3}$ versus $\frac{1}{2}\cdot\frac{2}{3}$).

The following scenario focuses attention on a common experience for teachers when SWDs in their classes engage in group work. Ms. Rene is a mathematics teacher whose 10th grade class includes SWDs. After whole group instruction, Ms. Rene assigns her students to groups. The group task is to use coordinates of polygons and the distance formula to compute polygon perimeters and rectangle areas. At the end of the lesson, group responses to the assignments are submitted, and Ms. Rene infers that the students seemed to understand the concepts on which they were working. However, Ms. Rene is not entirely satisfied, in that, during group work, she had noticed that Billy, a student with a learning disability, seemed not to be attentive at different times during the group activity. For example, when Mr. Miller (the principal) interrupted class to announce the game-day schedule over the loudspeaker, Billy, like others, stopped his work, but, unlike others, he did not return readily to the mathematical task. His peers progressed in solving the task as Billy perseverated on the announcement. Turning her attention to Billy's group after a while, Ms. Rene observed that the group, including Billy, was again working, and discounted what Billy's short hiatus from the problem may have had on his understanding.

When Ms. Rene examined the students' work at the end of the unit, she noticed that many SWDs, including Billy, struggled to compute perimeters of polygons and areas of rectangles using the distance formula. Ms. Rene was perplexed. Her students have a variety of disabilities, and Ms. Rene needed a strategy that would address a range of disabilities. She reached out to her colleagues for ideas that might help her understand a generalizable root of the SWDs' difficulties and how she could better support her students. Her colleagues informed her that this had happened to them during their careers, and they had not come up with a strategy that would cut across the range of disabilities presented by students. They have scoured the Internet for general strategies that might be responsive to a range of SWDs, without success. After lengthy communications with her colleagues, Ms. Rene was discouraged about the prospect of general strategies for supporting SWDs.

The following presents challenges encountered with group work based on observations from research related to why some SWDs struggle working in groups, and five tools (see Figure 1) that are effective, efficient, free, and usable in the context of inclusive mathematics classrooms to help these students. These tools are even effective for novice mathematics teachers.

Students Who Struggle with Group Work

When SWDs find themselves working in less structured environments (e.g., group activities, project-based learning) where minimal feedback and supports are in place, several issues can surface. Issues SWDs face during group work may include (a) being off task during group work, causing them to fall behind their peers, (b) giving up on the problem entirely (c) being satisfied with whatever their peers propose as a solution, (d) working hard on the problem, but not arriving at correct answers while their peers do, (e) arriving at the incorrect answer and after

correction, continuing to draw from their incorrect strategy, and (f) actively struggling to make the connections but fail to do so because of time constraints may go along with the group without ever making a personal connection to the concepts.

Teachers' misconceptions about SWDs can form roadblocks to SWDs' successful learning of mathematics. Although SWDs' inability to do particular tasks is often attributed to their not paying attention, the core of the difficulty is not that they are distracted but that, after distraction, they have difficulty returning to the task at hand. Their oversensitivity to factors in their environment block their return to the task at hand. Students with disabilities can understand mathematical concepts if teachers provide purposeful individualized behavioral supports. For example, adults entering the room during classwork or announcements presented over the loudspeaker may redirect SWDs attention from the task at hand. Unlike students who notice these disruptions but continue to work in their groups, SWDs are often overly sensitive to stimuli. They may focus on disruptions, miss critical conversations, and miss a crucial step in their group's progress in solving the problem.

Five Tools to Support Students with Disabilities

Certain research-based practices have been shown to support students in inclusive mathematics classrooms, and may be especially effective for SWDs as they work in groups. These tools are minimally invasive approaches that can be employed in the context of group work in mathematics classrooms without the burden of additional planning or bulky intervention packages. Teachers can incorporate these tools into their daily practices for the benefit of all students but particularly to support SWDs.

For SWDs to be successful in mathematics, their behavioral needs must be accommodated. Not only must teachers support students' mathematics learning, they must also attend to behaviors that may negatively influence mathematics learning. Working in groups requires each member of the group to synchronize his or her thinking with that of other members of the group. If teachers are not attending to behaviors that divert student attention, that synchronization may falter as SWDs fall behind the rest of the group and struggle to make connections with mathematical concepts. When teachers encourage appropriate classroom behaviors, SWDs' mathematical understanding can be improved without the need for complex behavior intervention plans. During group work, the tools described here work especially well for SWDs who may engage in behaviors that can impede their learning (e.g., off-task, disengaged, inappropriate behaviors). These tools are (a) assigning roles to students in group work, (b) using proximity control with redirecting, (c) engaging students by boosting their interest, (d) conducting frequent checks for understanding, and (e) delivering behavior-specific praise.

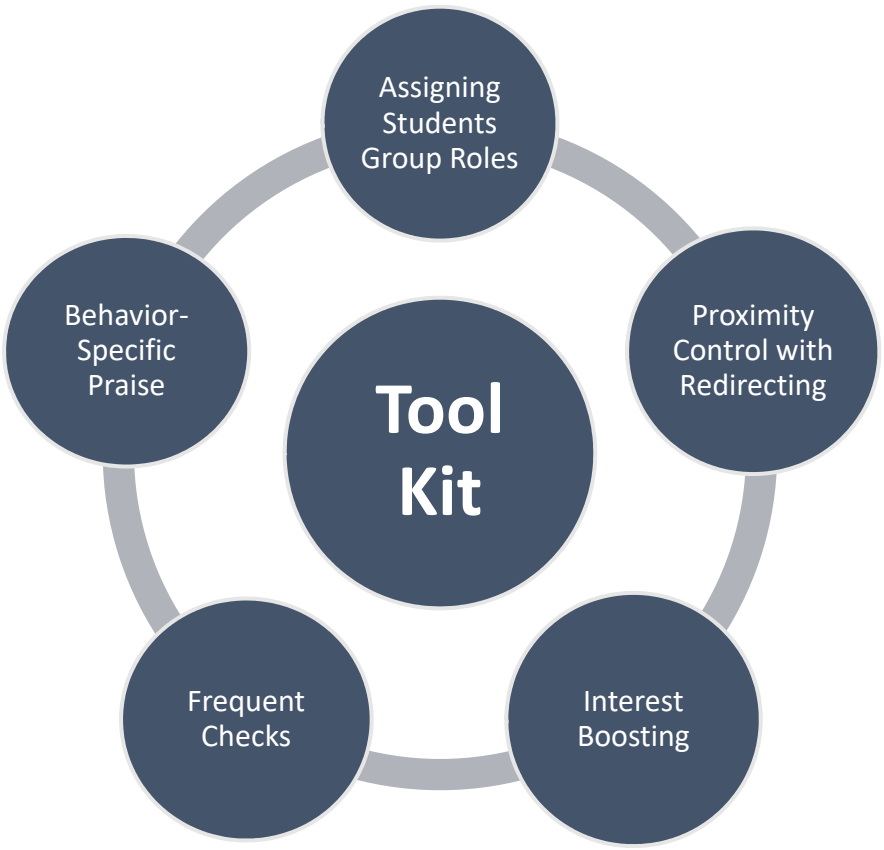

Figure 1. Five tools to support students with disabilities.

Assigning Students to Roles in Group Work

There are times when SWDs are not clear on their roles in group work, leaving them to guess the intended focus of attention or resulting in a lack of engagement in the task. Assigning students to roles in group work clarifies their focus and makes them accountable in a specific way to the rest of the group. In order to be effective, group work on mathematical tasks requires that all members of the group engage and coordinate their efforts to contribute to progress on solutions. Individual roles during group work can promote students' engagement in cooperative work on mathematical tasks. SWDs can be assigned as recorders, questioners, timekeepers, and reporters (Johnson & Johnson, 2009). For example, a student who is assigned the role of the questioner ensures that all possibilities have been explored by posing questions. The questioner might provide motivation for students with other roles (including SWDs) to stay on task. The importance of individual accountability during group work is in providing students with an incentive to help each other and to encourage each other to put forth maximum effort (Slavin, 1995). In our scenario, Ms. Rene could have assigned roles for the group activity that help students, like Billy, who are often off task during group activities. Billy could have been assigned the recorder role during group work. By assigning Billy this role he now needs to keep track of the group progress, which should help him know what he needs to do during group work. This role assignment is likely to help him stay on-task and provide him with accountability during the activity.

Proximity Control with Redirecting

Every teacher knows how effective it is to stand near a child who is having difficulty. The teacher is a source of protection, strength, and identification, which helps the child control his or her impulses by her proximity (Long & Newman, 1980). Proximity control can be exercised by a teacher who moves towards a student he or she suspects might not be fully engaged in the group activity (e.g., doodling, daydreaming, talking to peers). Moving close to the student will encourage her or him to participate in the group activity rather than engaging in off-task or disruptive behavior. Proximity control helps the student refrain from actions that get in the way of learning and reengage in the academic task (Sayeski & Brown 2011). To further support students, teachers can pair proximity control with redirecting. Redirecting involves asking the student to do a task, like solving a problem or answering a question, or to refocus the student's attention on the group work. For example, during instruction, Ms. Rene notices Billy staring out the window as his group members continue to solve the problem. Ms. Rene can make it a point to casually stroll by Billy's desk and quietly ask him (so only he can hear) to catch her up on where the group is in its solution. This way Ms. Rene is encouraging Billy to stay with the group so he does not miss an important step. Teachers using proximity control and the redirecting techniques together can support SWDs during group activities without having to call the student out in front of his or her peers and potentially embarrassing the child and causing him or her to disengage further.

Interest Boosting

Interest boosting occurs when stimulating the child's interest may motivate him to continue his work (Levin & Nolan, 2013). It may be helpful for the teacher to show an interest in the student by engaging in a conversation on a topic that is of interest. Using the interest boosting technique could look something like this: When students are working in groups to find the area of an irregular figure, Ms. Rene notices Billy's interest is declining and showing signs of boredom and restlessness. Ms. Rene is aware that Billy plans to take over his family's landscaping business, and uses this to increase Billy's interest on the task. Nonchalantly, she moves over to Billy and asks him (quietly as to not draw attention to him) how he would figure out how much mulch he would need for a given garden. Ms. Rene, thus, encourages Billy to get back to thinking about the mathematics on which his group is working so he can help them find the area of an irregular shape—which he does.

Frequent Checks for Understanding

Teachers often assess student understanding through traditional formative and summative assessments. For SWDs, particularly those working in groups, frequent checks for understanding are needed. Frequent checks for understanding allow teachers to determine the extent of students' understanding before they fall behind the group's reasoning. Frequent checks also cue the teacher in to potential misconceptions and whether they need to intervene (Rosenshine, 2012). Moving between groups, the teacher can check understanding by asking students to summarize what they have done to that point, to think aloud as they solve a mathematical problem, or to explain a particular position. It is important to frequently check for understanding with SWDs to ensure that they understand the mathematical concepts; however, it is counterproductive to put a student on the spot and embarrass him or her. It is also ineffective to simply ask, "Are there any questions?" because some students with disabilities regularly encounter academic failure and are reluctant to admit that they are confused (Hartman-Hall &

Haaga, 2002). Additionally, students may not be aware of their misconceptions.

Behavior-specific Praise

Frequent checks also provide the opportunity to deliver behavior-specific praise (BSP) to students on their performance. Behavior-specific praise is an evidence-based practice with positive effects for a multitude of student behaviors (Simonsen, Fairbanks, Briesch, Myers, & Sugai, 2008). The critical component of BSP is specifically identifying the desirable behavior you are praising. Telling SWDs that they have done a good job is not specific enough to let them know what they did well. Teachers need to state explicitly why the student did a good job.

For instance, during group work activity Ms. Rene moves to Billy's group who is trying to find out the sum of the first *N* positive integers. Billy made the observations that: if he adds 1, 2, and 3, he gets a result of 6; if he adds the first four integers, he gets 10; and if he adds the first five integers, he gets a result of 15. He notices a pattern in the 3, 6, 10, 15. This sequence results by adding 3 the first time, 4 the second time, and 5 the third time. Now he is guessing that he needs to add a 6 to get the sum of the first six integers. At this point, Ms. Rene is pleased that Billy has come up with the correct number but recognizes the importance of checking for understanding before providing BSP for Billy's contribution and appropriate group work. After Ms. Rene checks for understanding, she provides BSP for his contribution, "Billy, I really like how you discovered the pattern in this activity by looking for differences and how your observation helped the group to come to a general way to find the sum of the first n integers. Your contribution advanced the thinking of the group. Great work!"

One of the most important keys to the success of BSP is providing it immediately after the appropriate behavior occurs, increasing the likelihood that the behavior would occur again. As a bonus, BSP may have the potential to contribute to a growth mind set (Dweck, 2008), giving students like Billy the confidence that he can learn.

Conclusion

In instructional strategies, such as group work, it is important for each group member to follow and contribute to the thinking of the group. The behaviors of SWDs can lead to students struggling to stay with the group, resulting in their falling behind in following and contributing to the work of their group (Rosenshine, 2012). The five tools provided in this article can be used separately or in combination. Assigning roles to group work, proximity control, redirecting, frequent checks for understanding, and BSP are quick, easy, and minimally intrusive tools educators can use to support SWDs during group work in mathematics classrooms. Teachers can incorporate these tools into their daily practices and use them "on the fly" to improve students' academic and behavioral success during group work.

Because group work in mathematics is replete with potential distractions, SWDs may be easily sidetracked when their instruction is configured in group work. As a consequence, behaviors in which SWDs engage in the context of group work can form roadblocks that hinder learning. Additionally, teachers may not be aware of the specific impact that these behaviors have on the success of group work. Success with SWDs in the context of group work can be facilitated using five simple tools. Using the five tools, teachers can respond in a professional manner to students

who are struggling with a range of issues that are particularly problematic in the context of group work, and they can do so without putting the student on the spot and possibly creating a more difficult situation. The tools presented in this article provide inclusive teachers a way to intervene properly when they notice issues in SWDs' group work. These tools can break through barriers that block content acquisition in mathematics. These strategies are not the only strategies available to inclusive teachers working with SWDs and certainly are not a panacea for content acquisition or managing challenging behavior. They are, however, tools that are easy to use, even by novice teachers. For additional resources on improving the educational outcomes of SWDs including additional behavior management techniques visit https://iris.peabody.vanderbilt.edu/.

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