

**Helping New General Education Teachers Think
about Special Education and
How to Help Their Students in an Inclusive Class:
The Perspective of a Secondary Mathematics Teacher**

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Abstract

Often, general education teachers receive minimal instruction in working with students with disabilities. While most undergraduate programs require general educators to take a basic course on the requirements relative to differentiation for an individual with exceptional needs, it was my experience that this course offered more information on characteristics of disabilities rather than knowledge, strategies, and interventions needed to help meet the individual student needs within an inclusive environment. This paper focuses on strategies that I implemented with the guidance from my graduate course instructor. I found these strategies and collaborative experiences to be successful during my first years as a general education math teacher at the secondary level. The purpose of this paper is to share my experience to support student success that centers on whole schooling - particularly secondary classrooms. Special education aspects examined include: co-teaching, secondary math strategies or interventions such as visual cues and mnemonics, Individual Education Programs, accountability among students, and successful self-advocacy.

Keywords: inclusion, secondary education, co-teaching, strategies

Introduction

I never imagined as a secondary math teacher that I would have a student with Down syndrome in my college preparation Algebra class, let alone students with behavioral or learning disabilities. However, during my first year of teaching, my entire general education math schedule included several students who had an Individualized Education Program (IEP). An IEP is an individually designed program that outlines specific goals, objectives, related services, and other pertinent information to help support the success of a student with disabilities, thereby affording him/her access to the general education curriculum with same age/grade peers without disabilities. As a secondary math teacher, I was familiar with the term IEP, but not the actual document because the course requirements for my secondary teacher preparation program only required one introductory course on characteristics of individuals with disabilities. The lack of knowledge on specific strategies and interventions for individuals with disabilities left me feeling underprepared to meet the needs of all of my students.

I have attended several IEP meetings for students enrolled in my inclusive high school math classes. Initially, the most input I could provide at these meetings was related to classroom performance, grades, and behavior. However, to truly be an advocate for my students and support successful inclusion within a global society, I needed to become more informed and trained in teaching and supporting students with disabilities.

The purpose of this paper is to share my experience of becoming a more effective secondary mathematics teacher in an inclusive classroom. And, while my experience was isolated to secondary classes, it is my hope that by sharing this information, it will help to support the success of new (and experienced) teachers, regardless their academic area, grade level or general or special education focus. I will discuss co-teaching, secondary math methods such as visual cues and mnemonics, self-advocacy and motivation among students, and empowerment.

Co-Teaching

During my first year of teaching as a secondary math teacher, the principal informed faculty that the adjusted math classes would be co-taught. This meant three out of five of my classes would include students with disabilities. Initially, I was apprehensive. I had no knowledge or training in teaching individuals with disabilities. And, I had never had extra personnel in my classroom either. So I was not familiar with these unforeseen supervisory roles.

During my first few years as a secondary math teacher, I co-taught with several special education teachers. One special education teacher in particular was a remarkable collaborating partner. Compared to others, the key to our success was mutual motivation. We both wanted (and were willing) to learn from each other, and we both wanted to discover new ways to support *our* students. We brought our specific knowledge, skills and strategies to the table every day – special education and secondary math—along with a positive and open-minded attitude about how we could work together to help all of our students learn and be successful. Professional collaboration can be one of the most powerful tools when seeking to meet the needs of students with disabilities, especially when teachers are willing to adapt and adopt strategies acquired

throughout the collaborative process (Brownell, Adams, Sindelar & Waldron, 2006; Friend & Cook, 2013). This success did not come easily for us as co-teachers; there were several challenges we had to overcome.

Friend and Cook (2013) contend co-teaching likens to a “professional marriage” (p. 176). I agree. It was a mutual give and take, sharing of responsibilities, and learning not only from each other but also about each other. We had to figure out how to blend personalities, styles, and our communication needs. Discovering our shared strengths, challenges, likes, dislikes, and openly supporting each other throughout the process was essential. We believed that we needed to model for our students that which we expected them to do in a global society.

Overcoming administrative obstacles such as large class sizes (or caseloads), the wide range of learning needs among students, and the seemingly endless amount of paperwork required to document progress toward Individual Education Program (IEP) goal attainment were additional monumental challenges we had to tackle throughout the process, without extra pay and without any additional time allocated to our already full schedules. But, we took it one step at a time, planning together, keeping an open mind, and sharing the challenges and successes along the way. We wanted to truly be partners, so the approach to our co-teaching included my partner teaching topics she felt comfortable teaching while I provided back-up assistance. Then we would reverse roles.

New statewide assessments, meeting annual yearly progress demands (measured by test scores), and college readiness standards at the secondary level complicated aspects of co-teaching and meeting the needs of all levels of learners in my inclusive classroom. Teachers were required to teach more information faster and better to ensure students could meet or exceed college preparation standards. With all of the extra responsibilities, the greatest challenge for us was finding a mutual planning time. To overcome this challenge, I arranged the curriculum to include additional independent practice for the students. During this time, the co-teacher and I planned for the following week’s lessons and discussed the current week’s challenges and successes. Because we had such a limited amount of time during one class period, we strictly adhered to a weekly agenda during our planning sessions (e.g., student success, student challenges, possible solutions, next week’s lesson, and accommodations.)

This particular co-teacher was not in all of my secondary college-prep math classes. In one of my non co-taught college-prep Algebra classes, I had a student with Down syndrome. He was assigned a one-on-one paraprofessional. The added responsibility of working with extra support staff was not a component of my teacher training nor was I taught how to supervise them. To overcome this challenge, I approached our relationship as if she was another co-teacher. We shared responsibilities of planning and discussing appropriate strategies for this particular student, as well as his progress toward IEP goal attainment during weekly meetings.

The collaboration with the support staff and co-teaching experiences and partnerships with other teachers brought out the best in each of us. The students appeared to have fun in math class, and I did too. Students had three adults available to help them at all times during the learning process. I believe the best co-teacher and partner is the one who encourages the other to step out of his/her comfort zone and support the other as s/he tries different strategies. But, with

all of this added support and collaboration, I wondered, ‘Were the students learning?’ In the next section, I will address different strategies and supplemental manipulatives we used, followed by a discussion of informal outcomes of achievement post-implementation.

Secondary Math Methods

Over the years I have learned and used a variety of strategies, which were shared by co-teachers and paraprofessionals with whom I have worked. These include the use of mnemonics (memory techniques), visual aids, manipulatives (hands-on learning tools) and the one thing I never saw myself using—music. It is not because I do not like music; rather, I never thought about using music to help teach secondary math.

Music can be an effective strategy to help improve the learning environment, creativity, and enhanced student learning, while simultaneously supporting students’ social and academic development (Paquette & Rieg, 2008). One of the co-teachers I partnered with adapted a song to help our students learn how to multiply matrices. She was confident (and quite convincing) that the students would enjoy it. And they did! I sang the steps of how to multiply matrices (Michael, 2006) to the melody of *Oh My Darling Clementine*.

Row by column, row by column;
Multiply them line by line;
Add the product, build the matrix;
You can do this every time!

Additional strategies include peer tutoring (with specific criteria of shared responsibilities to avoid additional work of either student and a rotation schedule among tutoring partners), the use of checklists (Martinez & Pellegrini, 2010), and the use of individualized, laminated visual cues, versus only using verbal directives (i.e., task organizers of what/how to do something; schedules of when to do something) (see Figure 1).

<u><i>Computer Lab Checklist</i></u>	
<input type="checkbox"/>	Enter user name and password
<input type="checkbox"/>	Open Internet Explorer
<input type="checkbox"/>	Go to Tutoring Website
<input type="checkbox"/>	Website: _____
<input type="checkbox"/>	ID: _____
<input type="checkbox"/>	Enter your user name: _____
<input type="checkbox"/>	Begin working on the tutoring lesson

Figure 1. Sample checklist used to promote independence and support self-determination during computer lab.

These strategies supported the success of all students, but specifically students who needed more individualized support to help meet their IEP goals and objectives targeting independence and self-determination. Prior to using visual aids, such as the laminated task schedule (see Figure 2), the paraprofessional and I repeatedly gave verbal prompts and reminders to the student with Down syndrome about daily routines or steps needed to complete specific assignments or learning preparedness. IEP goal attainment related to ‘independently preparing for class and completing assignments’ for this student was minimal for my class (< 2% weekly preparedness without prompting). He was verbally reminded on a daily basis to be seated, turn in homework, check homework, chart progress, etc.

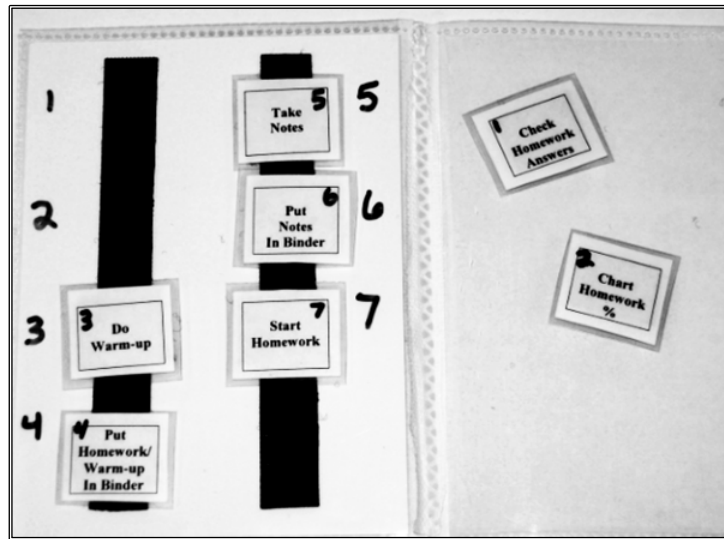


Figure 2. Sample task organizer used to promote independence and self-determination for college-prep Algebra class for student with Down syndrome.

The laminated task organizer (see Figure 2) included individually laminated square pieces of paper with expected behavior typed in the center of each square. A strip of Velcro was placed on the inside of a folder and Velcro loop circles were placed on the back of each square. When the student completed the task (expected behavior), he removed the square from the ‘to do’ side of the folder (left side) and placed it on the opposite ‘done’ side (right side). At the end of the class period, he prepared for the next day’s lesson by repositioning each Velcro square back on the ‘to do’ side of the folder. After teaching the student how to use checklists and a ‘to do’ schedule, we no longer needed to remind him. He independently entered class and prepared himself to learn. His success rate, based on informal behavioral observations and the number of prompts he needed to complete tasks increased from less than 2% weekly to 90% weekly preparedness, without prompting.

Using manipulatives and mnemonics also proved quite successful among all students in my inclusive classroom, especially for those with Specific Learning Disabilities (SLD). Many students with SLD have memory problems (Hughes, 2011). To assist students with these challenges, teachers and researchers frequently design acronyms or acrostics such that the first

letters of each step form a word or phrase (Access Center, 2006). A common learning acoustic (also known as a mnemonic) used to help solve multi-step algebraic equations is *PEMDAS*: *Please Excuse My Dear Aunt Sally*. These words correspond with the mathematical operations: Parentheses, Exponents, Multiply, Divide, Add, and Subtract.

In addition to multi-step equations, the substitution method is another challenging approach to solving algebraic expressions. To help my students be successful with this skill, I taught the substitution method by combining a mnemonic with manipulatives, I called it SPRES: *Solve easiest, Plug-in (substitute) and solve, Repeat plug-in for...Easiest, Show as an ordered pair*. When I introduced this mnemonic, I likened the title (SPRES) to the hard candy SPREES and used pieces of the hard candy as a manipulative for which students could arrange in different combinations to help create their own problems to solve during guided practice, then enjoy afterward (see Figure 3).

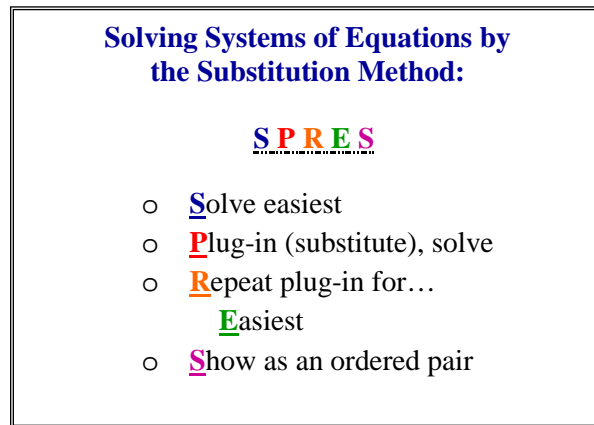


Figure 3. Sample mnemonic to remember the Substitution Method.

An additional method I found helpful for all of my students is the use of a visual timer. Timers can be used during whole class guided practice (SmartBoard display) or on an individualized basis during homework or test time (sand timer or stop watch on the student's desk). In addition, one of my students who required frequent breaks used a timer as a reminder in completing a specific number of problems before he took a break, or before he asked for affirmation from the paraprofessional that he was doing each step correctly. This type of visual aid helped to improve independence, successful classroom transition between tasks, and progress toward IEP goal attainment for our student with Down syndrome. Prior to using these strategies, our student with Down syndrome requested affirmation after every problem, and sometimes after completing each step to solve a problem. Post-use of these strategies, this student asked for affirmation after he independently completed three to five problems, versus every step along the way for one problem.

Encouraging Self-Advocacy and Motivation

To support and encourage accountability and self-motivation among students with SLD as well as those who had Emotional Behavioral Disorders (EBD) in my class, I took time and thoroughly reviewed all of my students' IEPs. I made notes relative to their post-graduation goals, professional and educational ambitions (college, skilled labor, job interests found in their Individual Transition Plan of their respective IEP for students age 14 ½ and older) and personal interests related to hair styles, music or radio personalities, interests in the armed forces or National Guard, etc. I also made notes about their IEP objectives and created my own individual 'case study form' which was used as a guide during individual meetings I conducted with each student. I included a section for their strengths (as evidenced by statewide assessments) as well as their needs and areas for improvement relative to math, such as: completing multi-step division, expanded notations, solving story problems, and solving for missing variables, to name a few (see Figure 4).

<u>Student Conference</u>
Name: _____ Date: _____
1) What do you feel are your strengths in Algebra? _____ _____
2) What do you feel are your weaknesses in Algebra? _____ _____
3) Do you have any IEP objectives in the area of Mathematics? _____ _____
4) Your latest EPAS score is: _____. The target score for ACT is 22.
5) After talking about strengths and weaknesses and looking at Discovery Education results (career options), what type of objectives could be added to your IEP? _____ _____

Figure 4. Student information sheet.

I wanted to make learning math relevant for my students. Reviewing each of their IEPs was enlightening because prior to this point, I was not aware I had the authority to access this type of information. I was also not aware of the benefits or the laws surrounding student-led IEPs and the effect this approach has on student self-efficacy (Wilson Hawbaker, 2007). The added insight proved to be invaluable – for me as well as my students. They had never looked at their own IEPs and if they did, they failed to understand what it was or what they were used for.

With the assistance of my co-teacher, I made arrangements in the curriculum to include independent practice so that I could meet with each student and discuss his/her personal goals and interests. I reviewed their IEP with them, their qualifying disability, strengths and challenges, and shared statewide assessment outcomes before comparing them to classroom assessments. I pointed out similarities of their challenges to these two resources (their IEP and the statewide tests). We discussed their strengths and personal ambitions and the relevance of being successful in my class and how it would affect their ability to be successful post-graduation. It was as if a light bulb came on!

The missing link was not only in my understanding why or how I could effectively use this information to help them but also for them to personally understand why some things were difficult for them and how they could be empowered to help themselves. At the end of our conversation, I asked students what type of objectives they felt could be added to their IEP for the next year. Several students felt comfortable sharing their personal ambitions.

Throughout the year, my students independently kept track of their own progress, graphing achievement scores and outcomes from classroom assessments. I held follow-up progress checks with each of my students on a monthly basis; again, collaborating with my co-teacher to support independent practice so that I could review student progress with them – connecting outcomes to their IEP goals. I created a chart and showed them how to monitor weekly progress toward IEP goal attainment. On Fridays, we took the last five minutes of my class to double-check outcomes of the weekly assignments—monitoring where the challenges were so they could ask follow-up questions about how to improve (see Appendix 1). I was genuinely interested in their success and students responded unimaginably well.

Motivation and interest skyrocketed after I started incorporating real world examples about their career and post-graduation interests. Seemingly defiant, argumentative, and negative attitudes—which resulted in having to remove students from my class nearly every other day—were reduced or eliminated, especially among students with behavioral disorders (80% weekly referrals/removal from my class decreased to 20%.) Students appeared positive, interactive, and respondent. Behavioral outbursts and removals from class were replaced with eager, motivated student exchanges. Students began asking more questions and offering appropriate, relevant responses to peer inquiries, while becoming more confident with peer interactions and front-of-class presentations. It appeared as though we were all connected, enthusiastic about learning, and motivated to help each other.

Empowerment

Teachers play a critical role in a student's ability to be a successful member of society. Teachers need to support self-advocacy, motivation, and interest among their students. In doing so, teachers need to involve students in their own learning; soliciting personal interests and offering relevant examples that connect their personal interests. In addition, teachers need to embrace their charge of creating a powerful and productive future. As a secondary teacher, I felt as though I needed to learn more about my students. I needed to be more effective. I needed to let them know I truly cared about their success post-graduation and not just whether they passed my math classes.

Learning how to be a better teacher required me to step outside my comfort zone. I welcomed the challenges of co-teaching in order to empower my students as well as others who worked with them. I conferenced with my students about their IEPs, their challenges, their strengths and invited them to be a part of their own learning process. The key to successful collaboration is the ability to accept each other's similarities and celebrate differences. Co-teaching embraced these ideals. Partnering with others, including my students offered a reciprocal learning opportunity. I learned that a student's IEP is a valuable resource, not only for them but also for me. I used information found in my students' IEPs to help support self-advocacy and accountability among all of my students.

Conclusion

Teaching methods such as music, visual cues, and mnemonics improved student achievement and independence, especially for my students with disabilities. Using a variety of methods helped to support the diverse population of learners within my inclusive classroom, and students appeared eager to learn. They were interested in the material and were able to improve achievement in my class whenever strategies were applied.

I learned how to be an effective teacher by opening my mind and welcoming challenges. Effective co-teaching allowed me to feel more comfortable in trying new strategies with my students and allowed me to engage in think-outside-the-box problem-solving in addressing student behavior and success in my class. As a secondary math teacher, I am empowered by this newly acquired information. I feel more confident in sharing student achievement during IEP conferences involving self-advocating students and supportive parents. I am encouraged by my experiences, and I look forward to building the future of my students to be productive members of a global society.

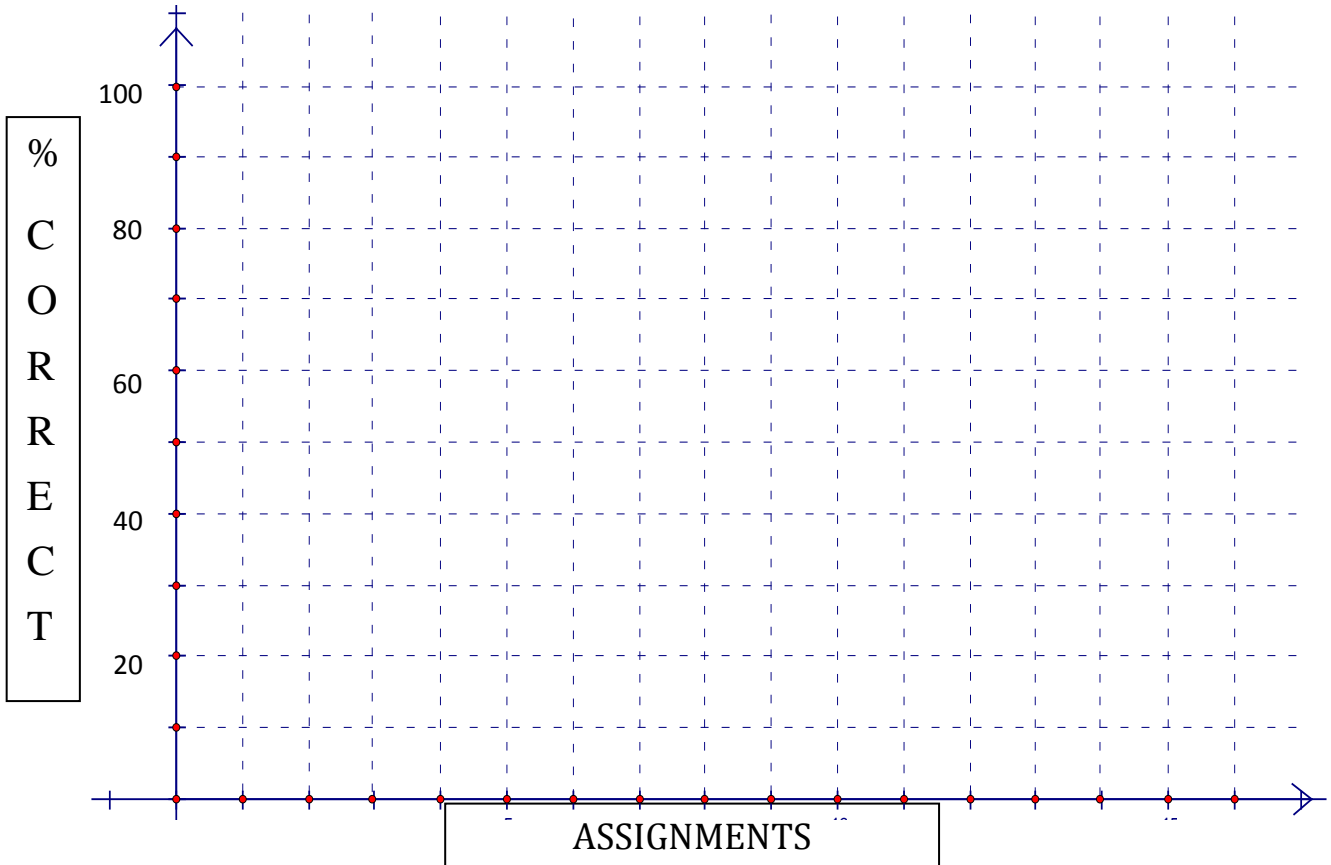
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APPENDIX I
SMART Goal Student Tracking Sheet

NAME _____

SMART Goal: _____



Concept	# Correct/ Total #	%

Concept	# Correct/ Total #	%