Closing The Gap

Solutions

contents
volume 38 | number 1

April / May, 2019

Building Sustainable Leadership and Practices in Assistive Technology

Both authors of this article (among other things!) have supported assistive technology (AT) teams in school settings across local, regional, state and national levels. A common trend among the AT teams we've worked with in different settings is the passion and dedication educators bring to their work. And, over many intensive late-night conversations, we asked ourselves what drew these educators to focus on AT and what would be necessary to support them in their practice to be successful?

As we've explored and reflected, we focused on the different roles of leaders in educational settings, the functions of leadership and finally, supports and resources that educators need to be successful, with a specific focus on AT. We share our ideas and thoughts in this article

LEADERSHIP DEFINED

How do you define leadership? Our definition of leadership is adapted from Peter Northouse in Leadership: Theory and Practice. That definition is "Leadership is a process whereby an individual (or group of individuals working in collaboration) influences others to achieve a common goal." In education, leadership can be found at multiple levels, including administrative roles which are assigned and leaders who emerge due to their ability to influence team members to reach for shared goals and objectives. In AT, leaders can arise from teachers, therapists, roles on AT teams, job coaching or mentoring positions and from being interested in utilizing technology for learning and growth with students with which you work. We will explore the ways leadership can be provided and argue for sustainable, quality AT leadership.

EDUCATION ADMINISTRATORS

There are a range of individuals who can be identified as top-down leaders in education. School administrators - such as superintendents, principals, special education directors and coordinators - are critical leaders with responsibilities in a range of areas. Educational administrators are managers. They have responsibilities in day-to-day operations. They are responsible for planning and budgeting, organizing staffing, establishing rules and procedures, being responsible for bus schedules and building maintenance, as well as the critical components of federal, state and local policy, parent engagement, student discipline and more. These are critical functions of an educational system.

JOAN BRESLIN LARSON M.ED. Joan is an independent consultant on issues relating to AT. Her work has a particular focus on leadership and developing effective teams to improve services for assistive technology. She was formerly a supervisor for services for students with low incidence disabilities at the Minnesota Department of Education. She has worked in AT for over 30 years as an independent consultant, in a school setting and at the state education agency. Joan is a member of the QIAT Leadership Team, and is a co-author of Quality Indicators for Assistive Technology, A Comprehensive Guide to Assistive Technology Services. She lives in Minnesota, and is the parent of three adult children.

DIANA CARL M.A. ODiana Foster Carl, M.A., has more than 35 years of experience in various capacities in public education and in leadership roles in national, statewide and regional organizations and boards. Carl, whose background is as a school psychologist, is a former Director of Special Education Services at Region 4 Education Service Center in Houston and lead facilitator of the Texas Assistive Technology Network (TATN). Currently she contracts with CAST as the Special Projects Coordinator for the National Center on Accessible Educational Materials, is a founding member of QIAT and a co-author of Quality Indicators for Assistive Technology: A Comprehensive Guide to Assistive Technology Services.rs.

Specific to AT, an administrator needs to know that there are statutory requirements regarding AT; they need to know that AT can benefit learners and what good practice looks like; and they need to ensure their district or school is in compliance with the law.

Educational administrators can also be inspirational leaders. In this role, they have the charge to establish a direction for their programs, to create a vision. They ensure that the right people with a passion for their work are in place and have the authority to complete the work assigned to them. The administrator is responsible for supporting and energizing their team.

Both as a manager and as a leader, the administrator is responsible for appropriately delegating responsibilities to others so that educators are efficacious in supporting students who need and use AT to be independent, productive and successful in reaching their educational goals.

The question becomes to whom should the administrator delegate that responsibility? In many cases, an administrator will find that there is an educator who naturally emerges as being a leader. This person typically demonstrates passion for AT work, communicates effectively, and demonstrates knowledge of the intricacies of delivery of AT devices and services, as well as implementation practices.

AT LEADERSHIP

AT Leaders frequently emerge from practitioners who have developed a specific interest in AT. They may be classroom teachers, speech and language pathologists, occupational therapists, physical therapists, aides or others. These leaders are viewed by their peers as knowledgeable resources and are considered their "go to" person for problem solving AT questions. When the AT leader takes on this extra, unassigned responsibility, it becomes a challenge for the leader to maintain their work assignment as well as this extra duty. Sometimes, an administrator will recognize the interest in, and passion the leader has for AT work and may assign them additional AT roles. It is important that the AT work is not on top of already significant demands.

An AT Leader in an educational setting will need several sets of competencies to be successful, including knowledge and skills related to:
- AT services and protocols;
- Applicable federal, state and local requirements;
- Agency educational structures;
- Collaboration with and inspiration of others;
- Analysis of current practice and determination of gaps or needs to improve practice;
- Implementation of an improvement plan to address the identified needs; and
- Evaluation of the impact of improvement planning and reporting of outcomes to administration.

A balance of AT leadership and administration functions is critical to develop a vision of what change is needed and a plan to move towards that change with appropriate supports to make that change achievable. Both need to have knowledge of the federal and state legal issues related to AT. The requirements in the Individuals with Disabilities Education Act (IDEA) to consider AT and provide necessary AT devices and services is "what" needs to happen to ensure students with disabilities have access to the tools and services they need. The legal statutes tell us "what" needs to occur but do not tell us "how" to proceed. In the following sections, we will propose methods to tell us "how" to develop high quality, sustainable AT programs.

AT SUSTAINABLE LEADERSHIP

Sustainable leadership is a model we endorse to support ongoing, effective and targeted leadership in AT. It requires commitment from both administration and from the AT leadership. In a sustained leadership model, agency administration has assigned a meaningful full-time teacher to a leader or leadership team. The administration publicly acknowledges the leadership role and works to ensure that others know to use the leaders as a resource and support. The administration has clearly defined expectations for the leaders, including what is expected for both obtaining and providing professional development, IEP team support, coaching, mentoring and developing agency-wide resources.

As was mentioned earlier, federal and state statues tell us "what" has to be done, but they do not tell us "how" to do it. Knowing "what" change needs to happen and knowing "how" to make change happen require different skills. Sustained AT leaders know "how" to support the delivery of AT devices and services in their educational system. They can address adult learning needs, have responsibility to keep their own skills current, and are knowledgeable about AT, educational practices, and systems change initiatives. The leader should also be monitoring performance of IEP teams, to be able to respond to needs as they arise.

USING QIAT TO GUIDE BEST PRACTICE

Best practices in the "how" to support the provision of quality AT services can be guided through the use of the Quality Indicators for Assistive Technology Services (QIAT). The QIAT indicators lead practitioners in identifying the eight areas where AT practice occurs (consideration, evaluation, inclusion of AT in the IEP, implementation of AT, evaluation of effectiveness, transition, professional development and administrative support). The indicator areas help a team define their role and supports for both the practitioner, the student and family members. The indicator areas each include five to seven specific indicators, which are clarified with intent statements.

The principles underlying the quality indicators require ongoing collaborative work by educators and families, respect ethical practice, are legally correct, are aligned to state and federal laws and are applicable regardless of the model of service

delivery. The indicators are designed to guide improvement of AT services so that students are better able to participate in and make progress in educational goals and to improve consistency of services to students in a way that supports implementation of IDEA and other educational mandates.

Each indicator area includes an innovation configuration matrix (ICM). The matrices identify variations from unacceptable to exemplary practice which will provide a team a method of self-evaluation of their current AT practice. Teams are encouraged to complete the matrices individually prior to a team meeting, and next to collaboratively determine a team score. The collaboration in deciding the team score is important, as it becomes an opportunity to discuss similarities and differences in how team members, with their various perspectives, see AT services delivered in their setting and their visons for improving services.

Using the ICMs over time will:
1. Identify data-based gaps and weaknesses in services;
2. Show what better practice looks like to support a team in developing targeted improvement practices, specific to the identified gaps;
3. Provide data on the impact of any improvement strategies implemented;
4. Provide data for administration to help share the success of the changes in practice.

USING IMPLEMENTATION SCIENCE TO SUSTAIN PRACTICE

In addition to knowing the components of quality AT services, as described in the QIAT body of work, we found that effective leadership occurs when there is a clear plan of how to create change in the educational system. Leadership, supported by an implementation team that develops, implements and evaluates change strategies, is an approach which has been found to be successful. The National Implementation Research Network (NIRN) has created a framework for mapping a course for effective change with a specific outcome determined. Change happens when there is systematic planning and implementation of change strategies. Using implementation science will support a team in making change happen in a way that is sustainable.

The work of creating change is the task of an implementation team. Implementation team members have unique knowledge regarding AT, implementation science and practice, creating change strategies and their own organization. For an AT change strategy to be successful, an implementation team needs to be formed which requires the support of an engaged administrator. The team needs to determine whether the district or school is ready to take the steps necessary to make change. They determine if there is capacity among peers to make change, whether there are the financial and time resources necessary to take on new activities. The team should be sure that this initiative will align with other agency priorities, and that there is alignment between the needs identified using the QIAT matrices, and the intervention the team is ready to put into place.

Critical to implementation science are the stages of implementation. There are four stages, each of which, used together, lead a team in creating sustainable change in practice. The four stages are:

1. Exploration, in which a team learns together about what change needs to happen to lead to change in practice. The team formalizes their implementation team, which should include supportive administrative leadership. The implementation team assesses needs and looks at potential solutions. They choose an intervention strategy or strategies which meet the identified need, and ensure they have the capacity to make needed changes.
2. Installation, during which an implementation team develops the strategies that will support the effective implementation of the change strategy. This includes ensuring there are resources available for creating and sustaining the change strategy, including allocation of time, fiscal resources, equipment, space, etc. This step is the easiest to overlook, as the Implementation Team gets excited about their new ideas, but it is critical to plan well before beginning the new activities.
3. Initial implementation is when the implementation team begins the work of changing practice. This is a time of great challenge. All participants are learning new skills. The status quo is challenged as new ways of working are put into place. The implementation team will be wise to address any challenges as they arise, to help issues from exacerbating. It is important also to evaluate how the change strategies are working, to ensure that the change that is desired is happening.
4. Full implementation is the final step, during which the majority of stakeholders are using the new strategies. An important measure is determining whether student outcomes have changed.

Implementing each of these stages should lead to sustainable change. Activities can overlap in stages, as team membership changes and new skills are learned. It's also important that teams document challenges as they arise and record solutions. This way, the team learns how to overcome issues and is ready to solve them more quickly if the issue re-occurs.

Teams should examine their current stage of implementation and strive to support change strategies through all stages. The National Implementation Research Network has a tool to help teams determine their stage of implementation. The Stages of Implementation Analysis: Where Are We? will help a team determine their stage and show strategies which will help them move to the next stage of implementation.

To dig deeper into the foundational issues related to devel-

oping sustained leadership, check out the module, Leadership: Making Quality Assistive Technology (AT) Services Sustainable, on the Texas Assistive Technology Network website.

PUTTING QIAT AND IMPLEMENTATION SCIENCE INTO PRACTICE

The Turtle Mountain Independent School District AT team has worked for several years to help their district provide good AT services. Their priority was to provide professional development to their colleagues. They focused on providing updates on tools and sponsored "app smackdowns" which were held at quarterly staff meetings. Feedback on all these activities was very positive, and the team felt that they were meeting the district's needs. One team member attended a conference and came back and told his teammates about a workshop he attended on QIAT. He was intrigued by the indicators and matrices and felt that the team should complete the matrices to show their director how well the team was doing.

To the team's surprise, the outcome of this activity showed that there were gaps in consistency in service delivery across settings. While the team did well in considering AT for students with significant needs, they did not consider AT for other students. And, while there was written guidance on how to document AT in the individualized education program (IEP), most team members did not know where to find the guidance document.

The team realized they needed to develop a more consistent delivery system of AT services so that access to AT and implementation was more equitable for all students. The team chose to focus on consideration of AT for all students, not just those with significant needs. The team looked at the range of outcomes in the matrix to help them decide what better practice would look like. They all knew they wanted to move their scores from the 1 or 2 rating they had given themselves to a 5. However, they were concerned that this would be too overwhelming of a task to accomplish within a short period of time. They decided that the most important step they could take was to work in a systemic manner to ensure that all staff knew about the legal requirement to consider AT for all students with IEPs and about the district guidelines.

They presented this need to their Special Education Director, Ms. Turicchi. She was pleased that there was quantifiable data about current practice and the team also knew what better practice would look like. The team acknowledged that they did not know how to go about changing practice across the district. They were especially concerned about making sure any new practices would be implemented consistently over time and were not short-term changes that failed.

Ms. Turicchi shared information about implementation science. She explained that implementation science would help the team begin with the end in mind – knowing what change would look like, including who would need to be involved, de-

veloping and implementing steps to make that change happen, and evaluating how the strategies were working at every step of the way.

Mrs. Turicchi stressed that sustainable change would not happen immediately but could take up to three to five years. The change process would also include coaching and mentoring of other educators so that more educators would be part of the new way of providing AT services.

The team was excited about developing sustainable practices and looked at resources available from the National Implementation Research Network (NIRN). They learned that creating sustainable change was a process that would require moving through the stages of implementation.

The team had already begun exploration using the QIAT indicators and had identified that they needed to improve the district's consideration practices. They were wise to include their Ms. Turicchi as an administrative champion. She gave them both the authority to work on the consideration processes and made sure other educators knew these activities were valued and important.

The implementation team was enthusiastic about what they learned and wanted to immediately begin professional development on consideration process. Ms. Turicchi suggested they were jumping in too fast and needed to take time to plan for how they wanted to make changes.

The team took the time to lay out an action plan for themselves. Some of the activities they prioritized included:

1. Meeting regularly to develop their plan;
2. Exploring resources available from other AT teams in the state and nation;
3. Developing district AT consideration guidelines, using resources available as guidance;
4. Getting guidelines approved at the district level and included on the district website;
5. Providing on-going professional development for colleagues about guidelines; and
6. Coaching IEP teams on a case by case basis to consider and document outcomes of consideration.

Once the team realized how big their first task was, they appreciated Ms. Turicchi's suggestion to take time. The team was careful to choose activities which would be doable as initial steps and to not try to make too many changes for their colleagues without being able to support those colleagues as practices evolved.

The Turtle Mountain Team wrote district guidelines, which were approved for use. The AT Team began to provide updates and training at all staff meetings. They were surprised that there was push back from their colleagues, who were not happy about learning another new process. Team members were lucky that Ms. Turicchi gave them lots of support and feedback during this

BACK TO CONTENTS

critical phase. She made sure that all educators knew that she supported the AT team's project and that AT consideration was required.

The AT team met monthly to review how training activities were going and identified challenges that came up, so they could address these challenges in a systemic manner.

Based on feedback from workshop participants, team members were able to diversify how they presented materials to their peers. They developed an internal webpage, loaded their resources on that page, and included a five-minute video on consideration. They also began to coach IEP teams in using the district resources and in consistent practice.

The AT team was anxious to see more educators using the new resources. They were surprised their workshop and follow up evaluations showed that there was not systemic improvement.

Ms. Turicchi addressed this with the team. She reminded them that change takes time and that systems can be resistant to change. She suggested the team review two documents. The first was the QIAT ICMs to see if change had happened as they had wished, and the second was the Stages of Implementation Analysis from the NIRN website. The Stages tool is designed to help a team assess, plan and track stage-based activities and improve the success of implementation.

Both tools helped the team. Using the ICM, the team saw steady progress in their self-ratings, increasing all scores in the area of consideration by a factor of one or two points. They were also gratified to see their ratings in several other indicator areas had also increased since consideration is a foundational skill in AT. They found surprises in the Stages of Implementation Analysis. They were not ready for full implementation as they had hoped. The Stages tool helped them identify which activities they needed to focus on to move their efforts further.

The Turtle Mountain district's AT team has made significant progress in improving access to AT services for their students. They credit three factors as being critical to their success. First, the support of Ms. Turicchi, the Special Education Director was essential in providing them with the time, resources and endorsement so that they could focus on systems change. The use of the QIAT Indicators and matrices helped the team identify their strengths, needs and areas most in need of focus. And, finally, the resources from the National Implementation Research Network helped the team focus on strategies to systemically make change. The ultimate benefactors of this work are, of course, the students who will have more consistent access to AT devices and services to support them in access to the curriculum.

MAKING A CHANGE IN YOUR WORK:

There are several critical factors needed in creating sustainable change in your agency's AT work. The first is knowing what is legally required in AT work, at the federal, state and local level.

The second is having the authority and the capacity to make changes happen in practice. This requires supportive administrative leadership who supports skilled and knowledgeable people in developing and implementing change strategies.

The third is knowing how change needs to happen to improve practice. The QIAT indicators point to excellent practice, and the matrices help a team focus on areas where both change in practice needs to happen and how to identify better practice.

And finally, the fourth, is using the strategies found in implementation science to assist a team in moving from wanting to make change to taking the steps to make meaningful change happen through planful, concrete actions that result in sustainable, positive practice.

With these strategies in mind, we wish you success in your journey to build sustainable leadership and practices in AT in your service area.

RESOURCES

Leadership: Making Quality Assistive Technology (AT) Services Sustainable, Texas Assistive Technology Network. Retrieved from http://www.texasat.net/training-modules/leadership-module

National Implementation Research Network. Retrieved from http://NIRN.fpg.unc.edu

National Implementation Research Network, Active Implementation Hub (http://implementation.fpg.unc.edu/#)

Northouse, P. G. (2016). Leadership Theory and Practice (7th ed.). California, CA: SAGE.

QIAT Leadership Team (2105) Quality Indicators in Assistive Technology: a comprehensive guide to assistive technology services. Wakefield, MA: CAST Professional Publishing. Quality Indicators for Assistive Technology. Retrieved from http://www.QIAT.org

Stages of Implementation Analysis: Where Are We? Retrieved from https://implementation.fpg.unc.edu/resources/stages-implementation-analysis-where-are-we?o=nirn ■

UPCOMING LIVE WEBINARS

PROFFESIONAL DEVELOPMENT

CEUs are provided by the AAC Institute and are available for live webinars at no additional fee (does not include sponsored webinars unless noted). A 60-minute webinar = 0.1 CEUs. A 90-minute webinar = 0.2 CEUs
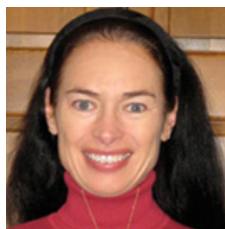
Perky Apps! Teacher Tools, Resources and Instruction for Students with ASD

By Susan Stokes
Thursday, April 4, 2019
3:30 pm – 5:00 pm (CDT)

Are you feeling like you need an "app spark" for your iPad? If so, this webinar will give you some "pick-me-up apps" that you never knew you needed!

Apps that function as teacher tools and resources, and apps that facilitate instruction will also be shared – some of which are tried and true favorites that have hidden gem features to meet the learning needs of our students with ASD. Be prepared to leave this webinar feeling iPad rejuvenated!

Top Ten Transition Tech Tools: Common Assistive Technology Tools used in Post-Secondary Educations

By Rachel Kruzel
Tuesday, April 16, 2019

3:30 pm – 5:00 pm (CDT)

Differences between K-12 and postsecondary education for students is abundant. The assistive technology that is available and is used is one of these differences. But how different are the tools used in postsecondary education versus K-12? What are the most common tools used once students get to college?

Attendees of this webinar will learn about ten (or more) of the most common assistive technology tools being used in the postsecondary education setting. Tool functionality and practical use examples will be addressed along with demos of the tools for better understanding for those working with students in high school or transitioning.

Ready to Empower? Introducing PRC's New Software

By Kara Bidstrup
Thursday, April 25, 2019
3:30 pm – 4:30 pm (CDT)

Are you ready to Empower? PRC is excited to introduce our new Empower software for the Accent line of products. Empower is quick, simple, easy-to-learn, and easy-to-teach.

This one-hour webinar will provide participants with an overview of the software, it will cover where it

is available, who is it for, and other frequently asked questions.

In addition, people will experience the clean, modern interface while learning about the new Toolbox, Editor, Word Finder, and Vocabulary Builder.

As always, Empower comes with the top notch PRC support and implementation resources you rely on.

Adapted Play in Early Childhood

By Ellie Hamilton
Thursday, May 9, 2019
3:30 pm – 5:00 pm (CDT)

Adapting play materials and environments enables young children with disabilities to be successful learners. Often goal focused instruction for young children does not include play. Adapted play is modifying and adapting the play environment based on an individual child's interests and needs

Assistive technology can support young children in accessing play. Play is crucial for child development. Young children with disabilities may require support and specific interventions to facilitate their play.

Switch Control Unleashed!

By Mark Coppin
Tuesday, May 14, 2019
3:30 pm – 5:00 pm (CDT)

One of the most exciting accessibility features of the iPad is Switch Control. Switch Control allows access to the iPad for persons who cannot access the device using the touch interface. Switch Control offers an extensive, powerful and customizable feature set that can be individualized to the needs of the user.

This webinar will explore advanced features of switch control. We will explore menu customization, creating recipes, using gestures, media controls, Siri shortcuts, and more.

Participants in this webinar should have a basic understanding of how to set up and configure a switch for automatic and step scanning.

https://www.closingthegap.com/product-category/upcoming-webinars/

Engaging and Interactive!

ARCHIVED WEBINARS

Over 100 archived webinars already included, plus more added regularly!

Creating Low-Cost AT Solutions for Blind, Low Vision, Deaf, HOH and Deaf-Blindness

BY THERESE WILKOMM

Recorded: March 23, 2017

LOG IN TODAY!

Do you need to document your learning? Members simply view an archived webinar and, upon completion, can request a certificate of contact hours. *It is really just that simple.*

www.closingthegap.com/webinars/archived-webinars/

Using Strategy Instruction and Flexible Assistive Technology Tools:
A Winning Combination for Secondary Learners with Disabilities to be Able to Meet Next Generation Learning Standards in Writing

INTRODUCTION

The Next Generation Learning Standards (New York State Education Department (NYSED), 2018) pose both an opportunity and a challenge for students with disabilities (SWD) to learn and demonstrate increased skills in writing. Secondary school learners are expected to write in nearly every content area and elective class with increasingly more complexity. Typical literacy-based tasks include reading grade level texts and producing written responses (e.g. informational texts, reflections, evidence-based responses), following steps of the writing process, and adhering to proper writing conventions. SWD typically struggle with various steps of the writing process such as pre-writing/planning, drafting, revising and editing, and publishing (International Literacy Association, 2016) and benefit from explicit teaching and

CAROL WILLARD Carol Willard is an Assistant Professor of Special Education in the Curriculum and Instruction Department at the State university of New York at Oswego, NY. She can be reached at carol.willard@oswego.edu

AMANDA FENLON Amanda Fenlon is an Associate Professor of Special Education in the Curriculum and Instruction Department at the State University of New York at Oswego, NY. She can be reached at amanda.fenlon@oswego.edu

KELSEY WILSON Kelsey Wilson is a special education teacher at Altmar-Parish-Williamstown Junior Senior High School. She is a graduate of the 7-12 Master's Special education program at SUNY Oswego. She can be reached at kwilson@apw.cnyric.org

BAILEY WOODARD Bailey Woodard is a 9th grade Special Education Teacher at the Liverpool High School Annex in Liverpool, NY and a graduate of the 7-12 Master's Special education program at SUNY Oswego. She can be reached at bwoodar2@oswego.edu

support for writing. Teachers need frameworks and flexible tools to help scaffold these learners. Many flexible technology tools exist that can support students in written expression. Using assistive technology together with evidence-based writing strategies can assist learners with various steps of the writing process and help them over traditional hurdles like planning a complex writing assignment and attending to writing conventions such as spelling and grammar. Moreover, in addition to meeting the general education core content standards, improved writing skills can lead to more opportunities in higher education and a better quality of life (Reid, Lienemann, & Hagaman, 2013).

This article will present two case studies where teachers used an evidence-based writing strategy in combination with flexible assistive technology tools to help students reach Next Generation Learning Standards in writing and increase overall self-efficacy with high school writing assignments.

COGNITIVE STRATEGIES USED TO SUPPORT WRITING SKILLS

An increasing number of SWD are required to meet the curricular demands in general education secondary core content classes associated with the Next Generation Learning Standards, as well as meet the demands of other high school elective coursework. Participation in these courses, however, often increases the writing demands for SWD and challenges their teachers in finding effective instructional methods to support students with diverse learning needs.

SWD need explicit instruction in writing, but unfortunately teachers are frequently at a loss for systematic approaches to teaching these skills. In a report on a national survey of writing instruction among high school teachers, Kiuhara and Graham (2009) recommend an increase in the use of research based practices in writing instruction, improved adaptations for struggling writers, and better professional development in methods to teach writing skills. This is especially relevant for SWD as they continue to underperform on assessments of written expression as compared to the general population of students in grades eight through twelve (National Center for Educational Statistics, 2012).

Cognitive strategy instruction, also known as strategy instruction, has been suggested as an instructional method to support the teaching of written expression. Strategy instruction is described as a specific instructional approach that teaches students the procedures, principles, or rules for completing learning tasks productively. Cognitive strategies are designed to be flexible and versatile; therefore, mastery can foster independent initiation and completion of learning tasks across contexts. This, in turn, can lead to improved student self-efficacy and attitude towards schooling as illustrated in the case studies described below. A strategy instruction approach helps SWD compensate for their learning needs by helping students become more efficient and systematic in approaching learning tasks. Researchers

have identified other benefits of strategy instruction, including improved memory/recall of information and enhanced self-regulation skills (Conderman, Hedin, & Bresnahan, 2013). Self-regulation skills include the student's abilities to monitor progress towards a goal and adjust his or her efforts accordingly. Self-regulation skills influence written expression; during the writing process, the writer must check and recheck their work to be sure their ideas are expressed as they intended through the written word, the ultimate purpose for writing.

Researchers, such as Rouse and Kiuhara (2017), have asserted the importance of learning purposeful strategies to self-regulate during writing to support key elements of the writing process, such as planning, drafting and revising written work. However, while many studies on writing interventions have highlighted the effective use of strategy instruction, few specifically address the role of strategy instruction in improving the writing skills for high school SWD (Cook & Bennett, 2014).

For each cognitive strategy, teachers should explicitly teach the strategy and its purpose, model its use, provide opportunities for guided and independent practice and advocate for generalization and maintenance of the strategy in a variety of authentic learning contexts, repeating steps as needed to achieve targeted objectives. This aligns with the gradual release of responsibility instructional framework (Fisher & Frey, 2014) thus fostering independent skills and self-regulation of written expression.

ASSISTIVE TECHNOLOGY AND HELPFUL FRAMEWORKS

Another recommended approach to supporting SWD in achieving the Next Generation Learning Standards is the use of assistive technology. Assistive technology (AT) is defined as "any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve functional capabilities of a child with a disability" (Individuals with Disabilities Education Act [IDEA], 2004, 602.1A). There is substantial research supporting the effective use of AT tools for students with disabilities from early intervention (Campbell, Milbourne, Dugan, & Wilcox, 2006) through secondary education (Houchins, 2009). Students with both high and low incidence disabilities benefit from all types of AT such as software for reading and writing, augmentative and alternative communication devices, and the use of iPads for video modeling instruction and applications; these tools help make the general education curriculum more accessible for SWD. Research on AT has shown that specific computer-based applications, such as mind mapping, can have a positive effect on the writing of secondary students with disabilities, enabling them to use higher order writing skills (Bouck, Meyer, Satsangi, Savage, & Hunley, 2015).

Furthermore, IDEA mandates that teams developing an Individualized Education Plan (IEP) must consider a student's need for AT at every IEP meeting. Members of the planning team

typically include special educators, therefore, special educators should be knowledgeable about their students' abilities and needs as well as AT tools that could assist them. The Council for Exceptional Children sets national standards for special education teachers, including Standard 5.6: "Special educators must be knowledgeable with regard to which assistive technology tools support their students' learning and access to general education" (Council for Exceptional Children, 2015). While special educators often recognize the potential benefits of using AT to support SWD, it is more challenging to decide on the best AT tools to use that align with the learner's strengths, needs and educational goals.

The SETT Framework (Zabala, 2005) is an organizational instrument to help teams create student-centered, environmentally useful, and task-focused tool systems that foster educational success. SETT, an acronym for Student, Environment, Task, and Tools, guides the planning team to collaboratively focus on the student and develop a tool system to support the desired learning outcomes, which frequently includes AT. The teams in the cases described herein adapted the SETT framework to include an additional "T" to include the specific teaching strategies and supports that were essential for the student's success. The SETT(T) framework gives careful consideration to a Student's strengths, interests, abilities and challenges (e.g., loves cinema studies, effectively learns from hands on activities, struggles with written expression), the Environment (e.g., attends a large urban high school, changes classes for content area subjects, receives one period of resource per day), Tasks (e.g., Social Studies course requires writing informational texts, English course requires writing narrative texts, using active reading/writing strategies across content areas), and Tools (e.g., digital graphic organizers, text to speech programs, digital book libraries). Good Teaching is at the heart of any student's success. The most effective special education teachers know their students well, have a repertoire of evidence-based cognitive strategies to support SWD in achieving desired learning outcomes, and can match student needs to appropriate technology tools. The following case studies highlight the potential of combining the use of systematic strategy instruction in writing with the appropriate use of AT tools. This powerful combination resulted in significant gains in written expression skills for the students.

INTRODUCTION TO CASE STUDIES

The included case studies highlight the work of two special educators teaching in two separate high schools in large suburban school districts. Both teachers coincidentally determined that written expression was an area of need for their student and decided on using the same cognitive strategy to teach writing skills: RACES. Although the origin of the RACES strategy is not documented, the strategy is often cited by practitioners as a useful strategy to support students' written response to text dependent prompts. Each letter of the RACES acronym aligns with

an important component in the written response: R (restate the question or reword it turn it into a statement), A (answer the question), C (cite evidence from the text to support your answer), E (explain your evidence) and S (state the summary). In the first case study, only the RACES strategy was taught, whereas in the second case study, the RACES strategy was combined with graphic organizers to support the learner. Similar to all cognitive strategies, RACES provided an effective, systematic and step-by-step framework to teaching writing to both learners. The iterative cycle of strategy instruction allowed each teacher to use data on the student's writing performance after each teaching session to plan appropriate next steps and keep the sessions focused.

Once the teachers decided on the use of the RACES cognitive strategy, each used the SETT(T) framework to collaborate with the respective planning teams at their high schools to design a supportive tool system for the learner to be successful at writing tasks required for their general education courses. Teachers in both case examples used Google Classroom (https://edu.google.com/products/classroom/?modal_active=none) to create an online class site to manage coursework materials, distribute assignments, grade student work and provide feedback to students. In addition, both special educators utilized DocsPlus (https://www.cricksoft.com/us/docsplus) for SWD to accomplish the specific writing tasks described in the case examples below. DocsPlus, software and applications geared for intermediate and secondary learners, offers a range of literacy and writing supports and can be installed for use with a variety of operating systems and devices, such as Chromebooks, laptop computers and iPads. Students in the case examples described below used different features of DocsPlus to accomplish their writing goals.

CASE STUDY #1 DEREK

THE STUDENT AND THE ENVIRONMENT

Derek was an 11th grade student with a LD in basic reading skills and written expression. He was able to identify the important information of texts, but he struggled with comprehending grade level material, read slowly and needed extra time to process what he read. Derek was able to generate ideas for writing assignments; however, he needed help with the organization of his ideas for longer writing assignments. He also struggled with writing conventions such as spelling, grammar and punctuation skills.

Derek was included in all content area general education classes and also received a daily period of small group resource/specialized instruction from a special educator. He had access to a computer throughout the day. Figure 1 shows a sample of Derek's writing prior to strategy instruction and the introduction of AT tools. (See Figure 1).
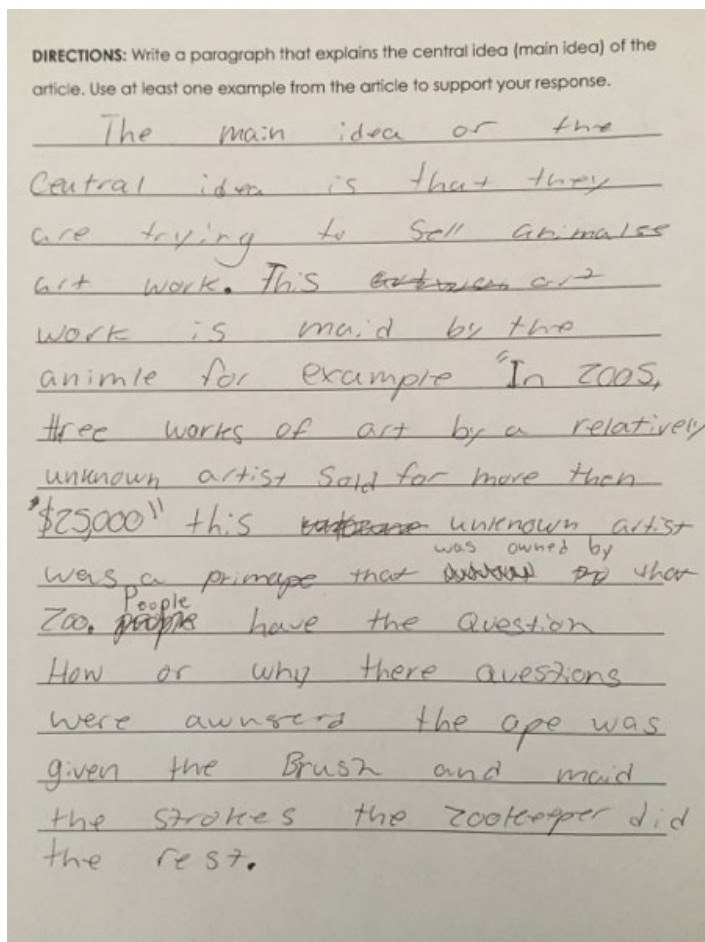
DIRECTIONS: Write a paragraph that explains the central idea (main idea) of the article. Use at least one example from the article to support your response.

The main idea or the Central idea is that they are trying to Sell Animales art work. This extrsion art work is maid by the animle for example "In 2005, three works of art by a relatively unknown artist Sold for more than '$25,000" this unknown artist was a primape that drawen by thar Zoo. People have the Question How or why there auestions were awnserd the ape was given the Brush and maid the strokes the Zookeeper did the rest.

Figure 1. Derek's writing before strategy instruction and AT tools

TASKS

In general education classes, especially ELA and Social Studies, Derek was expected to complete the same writing assignments as his peers. For English class, Derek needed to be able to write an evidence-based response related to *The Crucible* (Miller, 1953). Specifically, this task required him to read a grade-level passage on the Salem witch trials (see Figure 2), identify the central idea of the passage and respond to the writing prompt, "How do paragraphs 4-8 contribute to the development of ideas in this article? Cite evidence in your answer." This required him to organize his writing ideas and compose a response that included cited textual evidence. The response also needed to reflect standard writing conventions. This writing assignment aligned with the following New York State Next Generation Learning Standards in Reading and Writing:

11-12R1: Cite strong and thorough textual evidence to support analysis of what the text says explicitly/implicitly and make logical inferences, including determining where the text is ambiguous; develop questions for deeper understanding and for further exploration.

11-12W2: Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content (NYSED, 2018). (See Figure 2).

TOOLS

Derek and his teacher used various features of DocsPlus (https://www.cricksoft.com/us/docsplus) to complete the writing assignment. To help level the playing field, Derek used the

Witchcraft at Salem Village

Surely the Devil had come to Salem in 1692. Young girls screaming and barking like a dog? Strange dances in the woods? This was behavior hardly becoming of virtuous teenage maidens. The town doctor was called onto the scene. After a thorough examination, he concluded quite simply — the girls were bewitched. Now the task was clear. Whomever was responsible for this outrage must be brought to justice.
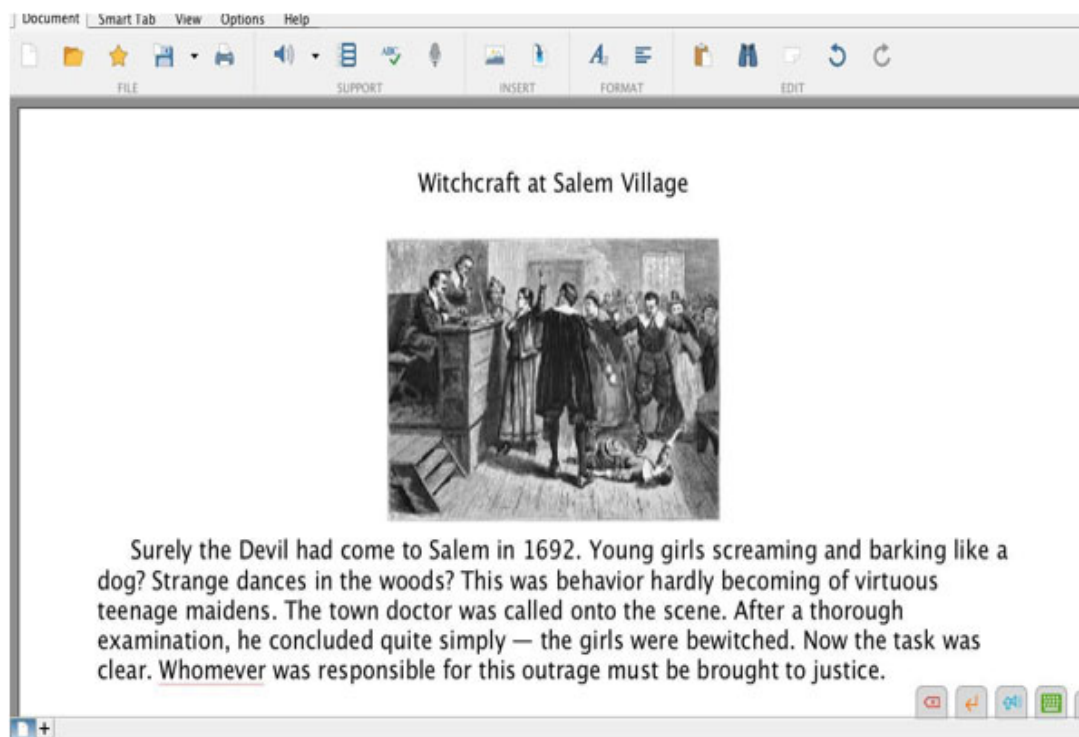
Figure 2. Grade level passage read with DocsPlus text to speech feature. Passage retrieved from www.commonlit.org/
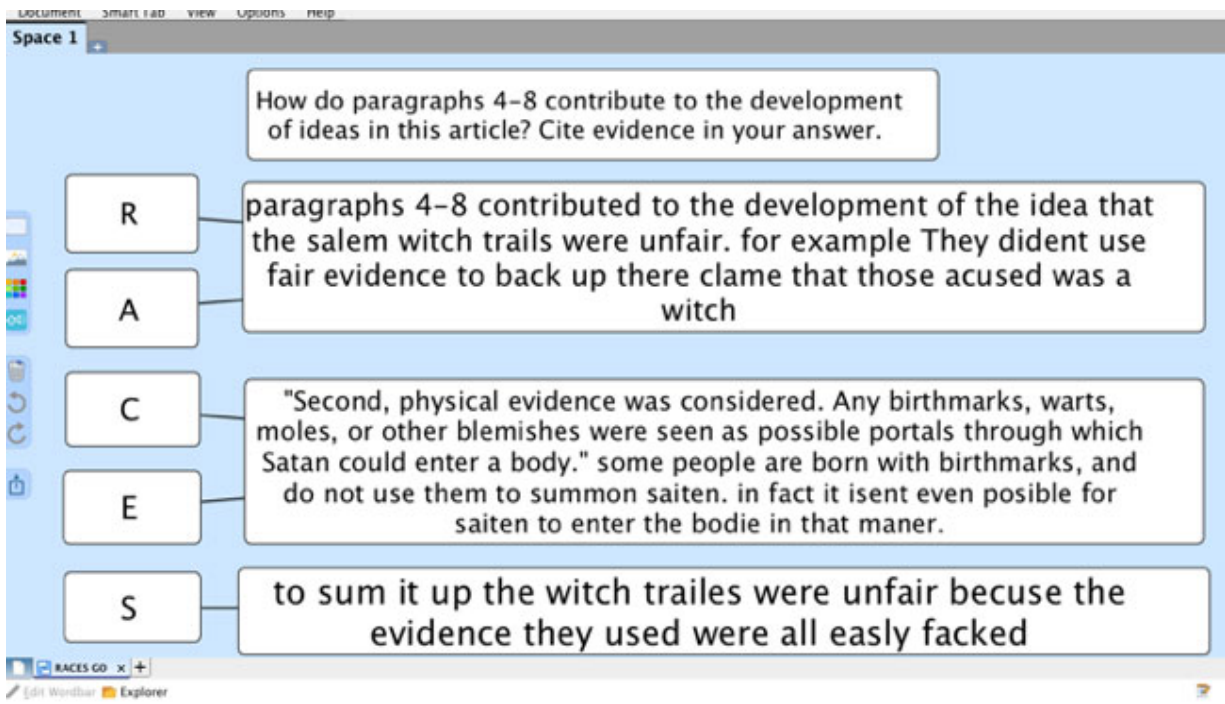
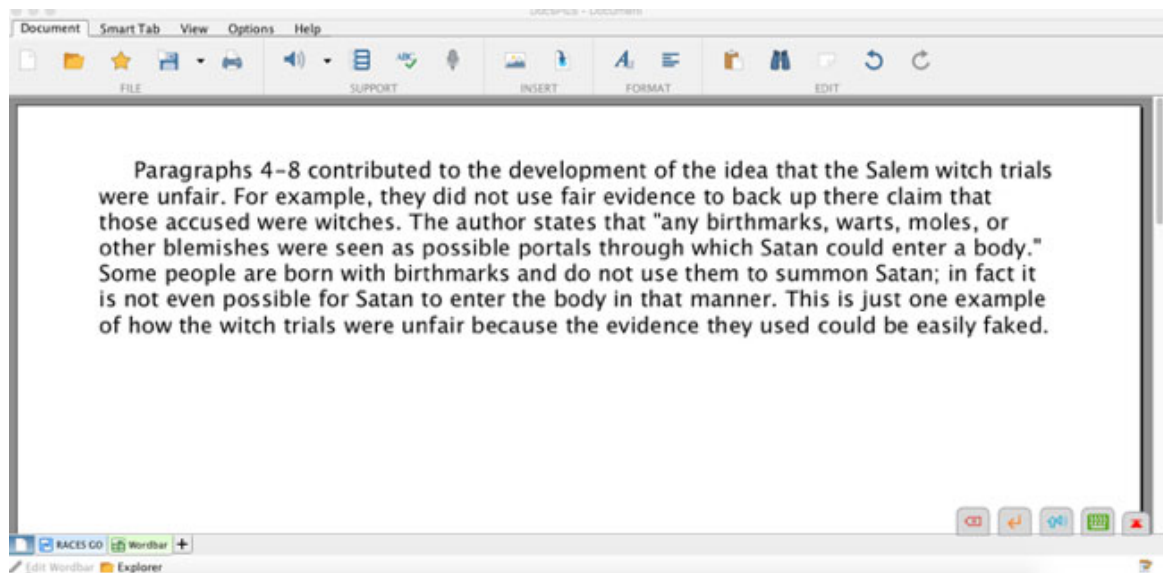Figure 3. RACES Graphic Organizer created in DocsPlus

Figure 4. Derek's writing after instruction in the RACES strategy and the use of DocsPlus

text to speech feature to have the grade level article read to him, allowing him to focus more on comprehension rather than decoding. The graphic organizer/workspace feature helped Derek generate and organize his thoughts prior to writing (see Figure 3). The text to speech and spell check features assisted Derek in editing his writing with ease; he was able to readily identify mistakes in spelling and grammar as he reviewed his written work with these features and make the necessary revisions (see Figure 4).

TEACHING

During Derek's specialized instruction period, his teacher explicitly taught him the RACES strategy. Derek first practiced identifying each component of RACES in model writing samples before working through each step of this strategy in guided practice. His teacher provided him with a RACES foldable that explained each step of the strategy with sentence starters. After initial instruction of the strategy, his teacher created a RACES digital graphic organizer in DocsPlus (see Figure 3), which allowed Derek the opportunity to organize his thoughts and ideas

In the text, "Lamb To The Slaughter" by Roald Dahl, the central idea is that people can seem nice on the outside but be dark and angry on the inside. Mary waited for her husband to come home, she offered him dinner, but he did not want it. She finds out that he is leaving her and then she gets angry and kills him. When mary is waiting for patrick to get home there were two glasses on the table ready to be used to drink. When he gets home she is all nice to him and makes him a drink. He got up slowly to get himself another drink, i'll get it she cried, jumping up, sit down he said". Mary was acting like a very caring wife. She went down stairs after he told her that he was leaving her and she got a big piece of lamb that was going to be there dinner and she hit him with the frozen piece of meat. "Aright, she told herself so i've killed him". In minutes she went from being so caring and kind to killing him. Mary seemed like a caring wife but really she did not care when she killed him.

Roald Dahl develops the central idea of people can seem nice on the outside but be dark and angry on the inside, in "Lamb to the Slaughter" through the use of Imagery. The story showed Imagery by giving us a mental image of mary holding the big block of frozen meat in her hand with her husband lying dead on the floor. "She came out slowly, feeling cold and surprised, and she stood for a few minutes, looking at the body still holding the meat tightly".

Figure 5. Ethan's writing prior to strategy instruction and AT tools

before writing his evidence based response (see Figure 4). Prior to using this graphic organizer, Derek's teacher modeled how to type ideas into the digital graphic organizer and send it directly into a document to be used as an outline. His teacher also demonstrated how to utilize the word prediction, spell check, and text to speech features. After guided practice, Derek quickly learned how to use these tools independently in order to compose his own piece of writing for his English class. (See Figure 4).

CASE STUDY #2- ETHAN

THE STUDENT AND THE ENVIRONMENT

Ethan was a 10th grader with LD in written expression and math, as well as Attention Deficit Hyperactivity Disorder (ADHD). He was willing to ask for and accept help, was friendly and polite and enjoyed sports. He was an enthusiastic participant in Cinema & Screen Studies, an English elective course that he was enrolled in. Ethan struggled with different aspects of the writing process, especially organizing ideas prior to writing. He could write short, simple sentences, but they often lacked detail. Figure 5 shows a sample of Ethan's writing prior to strategy instruction and the introduction of AT tools. Ethan was included in all general education classes with the support of a teaching assistant as needed for focusing and redirection. He required preferential seating in all classes and received one daily period of resource/specialized instruction from the special educator. (See Figure 5).

TASKS

Ethan and his peers were required to read and annotate several grade level texts and formulate an argument that either agreed or disagreed with the claim that celebrities should be the voices of humanitarian causes. He was required to find, cite and explain quotes taken from the texts to support his argument. It was expected that he write a draft with an introduction, two body paragraphs and a conclusion. After completing the draft, he was expected to revise his work. He was also expected to utilize proper writing mechanics. In addition, Ethan's teacher expected him to be able to utilize a digital graphic organizer, the RACES writing strategy, and AT tools to increase independence and confidence in writing. The argumentative essay assignment
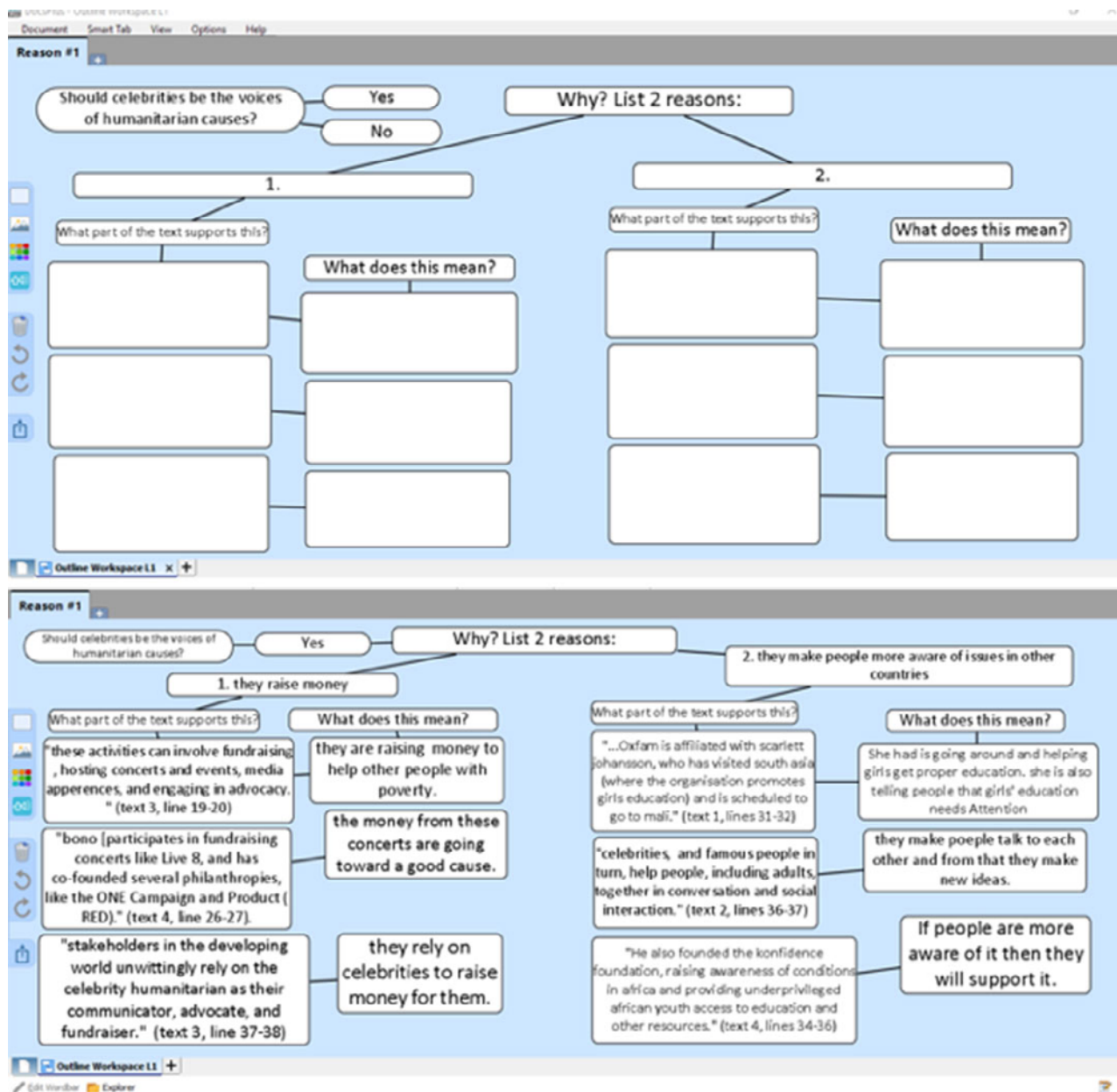
Figure 6. Graphic organizer/work space created for argumentative essay

aligned with the following New York State Next Generation Learning Standard in Reading and Writing:

9-10W1: Write arguments to support claims that analyze substantive topics or texts, using valid reasoning and relevant and sufficient evidence (NYSED, 2018).

TOOLS

Ethan's team chose DocsPlus (https://www.cricksoft.com/us/docsplus) as the most helpful AT tool to accomplish his tasks. Some of the features of DocsPlus that Ethan used included the graphic organizer/workspace, word bars, word prediction and text to speech. Because Ethan needed to generate and process his thoughts and manage the many steps required in this assign-

ment, the graphic organizer/workspace was especially helpful (see Figure 6). Ethan also used word bars and word prediction features in order to help him translate his thoughts into complete sentences more efficiently. Lastly, Ethan used the text to speech feature of DocsPlus as an editing tool. Using the speech feedback feature allowed him to hear mistakes in spelling and grammar and correct them prior to publishing his final piece (see Figure 8) .

TEACHING

Ethan's special educator introduced the RACES strategy by showing him a brief video presentation that concisely highlighted each step of the strategy: (https://www.youtube.com/
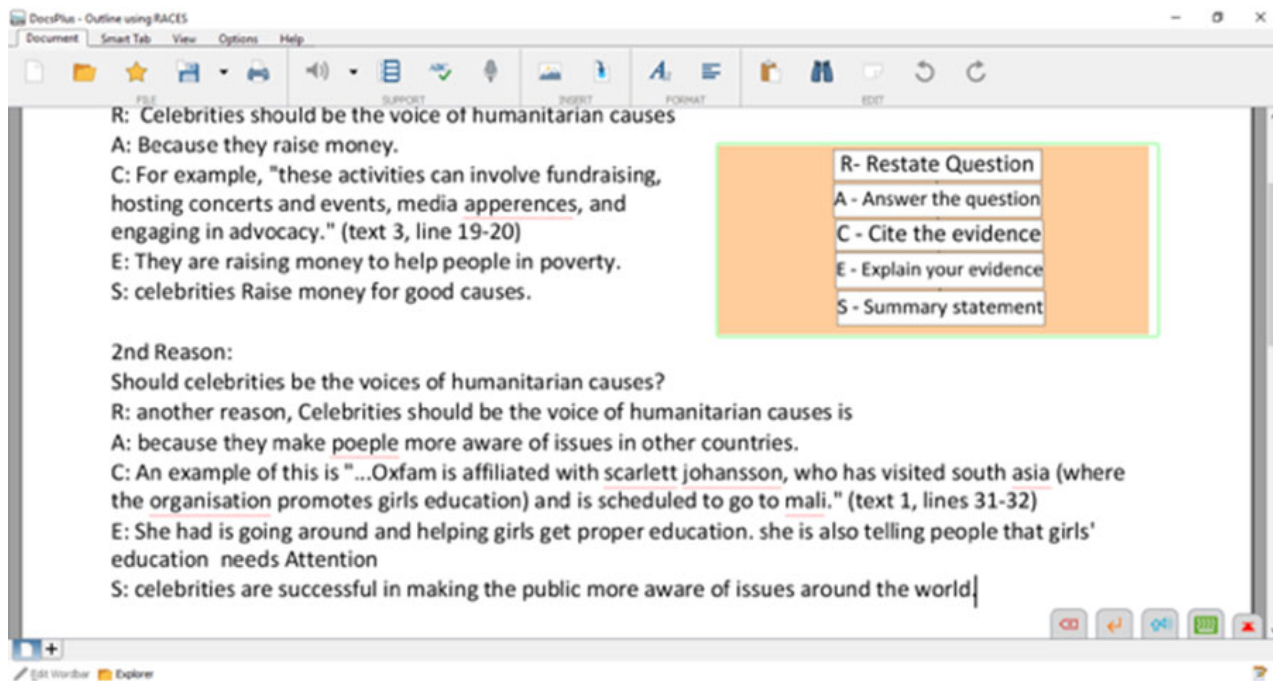
BACK TO CONTENTS

Figure 7. RACES strategy outline/workspace
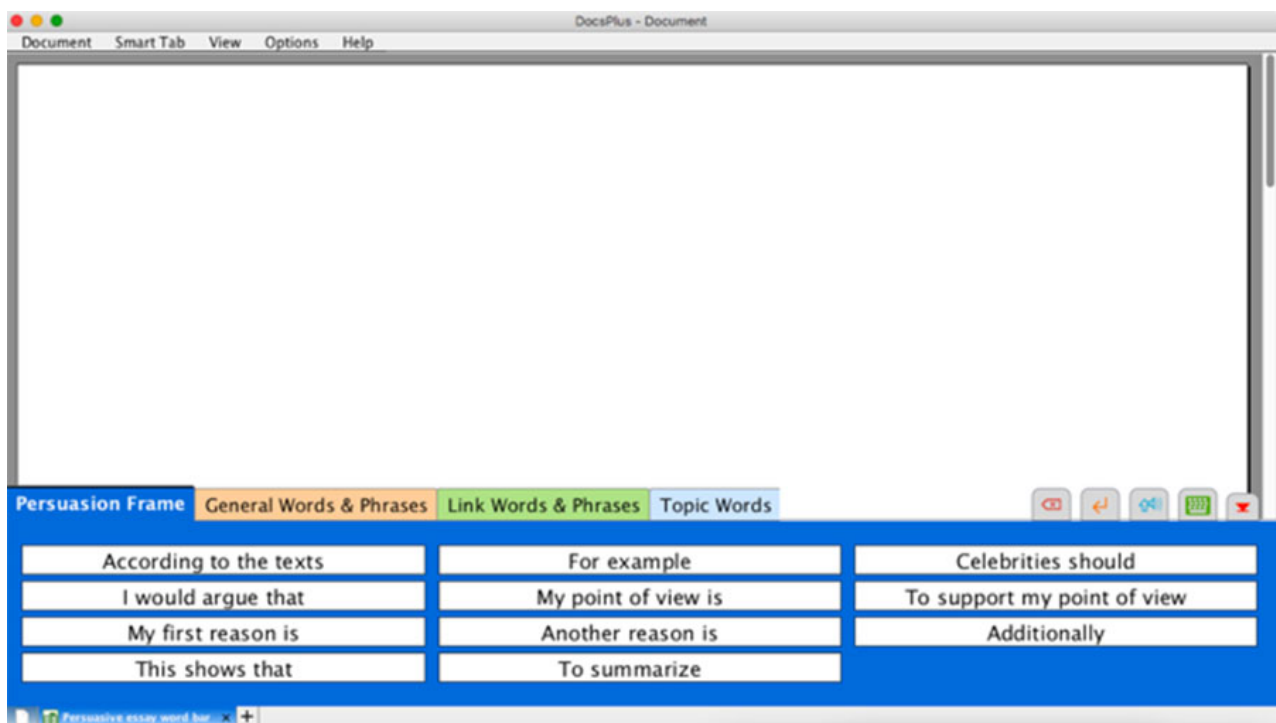

Figure 8. Persuasive essay word bar created in DocsPlus.

). Using the gradual release of responsibility model (Fisher & Frey, 2014), Ethan's teacher demonstrated how to use the workspace and complete the RACES outline for the first paragraph (see Figure 7). She continued modeling how to take the ideas that he generated in the graphic organizer and insert them into the RACES outline. Together, they completed the "R" part of the second paragraph outline, providing Ethan guided practice. Ethan was then given a chance to independently complete the outline for the second paragraph, asking questions when necessary. Ethan's teacher also created a persuasive essay "word bar" that he could use when writing his persuasive essay. (See FIgure 8). Word bars provide vocabulary support for any curriculum topic. These words and phrases aligned with language from the RACES strategy.

Celebrities are already involved in humanitarian causes, but people don't all agree on if they are more helpful or harmful. Some celebrities do this through fundraising, live events, passing laws, and traveling. According to the texts, "The Celebrity Solution," "Ethics of Celebrities and Their Increasing Influence in 21st Century Society," and "Do Celebrity Humanitarians Matter?" celebrities should be the voices of humanitarian causes because they raise money and they make people more aware of issues in other countries.

Celebrities should be the voice of humanitarian causes because they raise money. For example, "these activities can involve fundraising, hosting concerts and events, media appearances, and engaging in advocacy." (text 3, line 19-20) They are raising money to help people in poverty. Celebrities raise money for good causes. Celebrities should be the voice of humanitarian causes because they raise money. For example, "Bono participates in fundraising concerts like Live 8, and has co-founded several philanthropies, like the ONE Campaign and Product (RED)." (text 4, line 26-27) The money from these concerts are going toward a good cause. When he fundraises, people go to the concert and he uses the money to people who are poor. Another reason humanitarian causes benefit from celebrity attention is to raise money. "Stakeholders in the developing world unwittingly rely on the celebrity humanitarian as their communicator, advocate, and fundraiser." (text 3, line 37-38). People in developing countries rely on celebrities to raise money.

Another reason, celebrities should be the voice of humanitarian causes is because they make people more aware of issues in other countries. An example of this is "...Oxfam is affiliated with Scarlett Johansson, who has visited South Asia (where the organization promotes girls' education) and is scheduled to go to Mali." (text 1, lines 31-32) She is going around and helping girls get proper education. She is also telling people that girls' education needs attention. Celebrities are successful in making the public more aware of issues around the world. Additionally, celebrities should use their fame for humanitarian causes because they make people more aware of issues in other countries. "Celebrities, and famous people in turn, help people, including adults, together in conversation and social interaction." (text 2, lines 36-37) Celebrities are bringing people together to talk and make new ideas. People listen because they are famous. Celebrities should be involved in humanitarian causes because they make people more aware of issues in other countries. An example of this is Akon. "He also founded the Konfidence Foundation, raising awareness of conditions in Africa and providing underprivileged African youth access to education and other resources." (text 4, lines 34-36) If people are more aware of the cause then they will support it. Celebrities use their fame to raise awareness of issues in poor continents like Africa.

According to the texts, "The Celebrity Solution," "Ethics of Celebrities and their Increasing influence in 21st Century Society," and "Do Celebrity Humanitarians Matter?" celebrities should be the voices of humanitarian causes because they raise money and the make people more aware of issues in other countries. Celebrities are raising money for good causes and they are trying to get other people involved in the issues, in order to help people in other countries, while using their fame to do so.

Figure 9 Ethan's writing after strategy instruction and AT tools

After Ethan completed the outline, he was taught to use the text to speech feature for editing. His teacher began by highlighting one sentence at a time. As Ethan listened to the text, his teacher prompted him to note different types of errors such as spelling or sentence structure. Ethan and his teacher collaboratively revised the sentence, again offering Ethan guided practice. When Ethan was confident in revising his writing in this way, his teacher highlighted a sentence and he was asked to fix it without prompting. As Ethan did this successfully, he then highlighted further sentences on his own. His teacher was able to stop him and direct his attention to any issues that he missed. This iterative process resulted in the final written piece (see Figure 9).

INCREASE IN SELF-EFFICACY FOR WRITING ASSIGNMENTS

In both case studies, SWDs gained confidence and improved their writing skills for challenging secondary school assignments. Both students demonstrated an increase in self-efficacy by taking on an increased responsibility for the steps of the writing process. As both students became more confident in their ability to plan, organize, construct and edit their written work, their confidence in completing writing assignments improved.

For Derek, the text to speech and word prediction features of DocsPlus supported his use of the RACES strategy, a systematic and organized approach to constructing a written response that scaffolded the task into manageable sections. Likewise, as demonstrated by Ethan, having access to DocsPlus word bars and word prediction features allowed him to focus more on expressing his ideas, rather than the laborious act of typing and spelling which previously stalled his writing efforts. Using DocsPlus alleviated a great deal of stress for Ethan and the writing assignment was much less time consuming and disorganized when using the RACES strategy.

Opportunities to use a cognitive strategy, such as RACES, combined with AT, such as DOCSPlus, have the potential to support students like Derek and Ethan in completing learning tasks necessary for success in high school coursework and beyond. The powerful combination of explicit teaching of a writing strategy and the use of "just right" AT tools proved successful with these learners.

REFERENCES

Campbell, P. H., Milbourne, S., Dugan, L. M., & Wilcox, M. J.(2006). A review of evidence on
practices for teaching young children to use assistive technology devices. Teaching
Early Childhood Special Education, 26, 3–13.

Conderman, G., Hedin, L. & Bresnahan, V. (2013). Strategy instruction for middle and
secondary students with mild disabilities. Thousand Oaks, CA: Corwin.

Cook, K. & Bennett, K. (2014). Writing interventions for high school students with disabilities: A
review of single-case design studies. Remedial and Special Education, 35(6), 344-355.

Bouck, E. C., Meyer, N. K., Satsangi, R., Savage, M. N., & Hunley, M. (2015). Free
computer-based assistive technology to support students with high-incidence disabilities
in the writing process. Preventing School Failure, 59(2), 90–97.

Ewoldt, K. B. (2018). Productivity apps supporting higher order writing skills for secondary
students with learning disabilities. Intervention in School and Clinic, 53(5), 313–320.

Fisher, D. & Frey, N. (2014). Better learning through structured teaching: A framework for the
gradual release of responsibility, 2nd Edition. Alexandria, VA: Association for Supervision
and Curriculum Development (ASCD).

Hill, R. A. (2015). RACES writing strategy. Retrieved from https://www.youtube.com/watch?v=Z0zB3KTdRng

Houchins, D. E. (2009). Assistive technology barriers and facilitators during secondary and
post-secondary transition. Career Development for Exceptional Individuals, 24, 73–88.

International Literacy Association (2016). Implementing the writing process: Strategy guide.
International Literacy Association. Retrieved from http://readwritethink.org/professional-development/strategy-guides/implementing-writing-process-30386.html

Kiuhara, S. & Graham, S. (2009). Teaching writing to high school students: A national survey.
Journal of Educational Psychology, 101(1), 136-160.

Miller, A. (1953). The Crucible. A Play in Four Acts. New York: Viking Press.

National Center for Educational Statistics. (2012). The nation's report card: Writing 2011 (NCES
2012-470). Washington, DC: Institute of Education Sciences, U.S. Department of
Education. Retrieved from https://nces.ed.gov/nationsreportcard/pdf/main2011/2012470.pdf

New York State Education Department (NYSED). (2018). 9-12 Next Generation Learning
Standards. Retrieved from http://www.nysed.gov/next-generation-learning-standards

Reid, R., Lienemann, T., & Hagaman, J. (2013). Strategy instruction for students with learning
disabilities, 2nd Edition. NY: The Guilford Press.

Rouse, A. & Kiuhara, S. (2017). SRSD in writing and professional development for teachers:
Practice and promise for elementary and middle school students with Learning
Disabilities. Learning Disabilities Research & Practice, 32(3), 180-188.

United States of America. The Individuals with Disabilities Education Improvement Act. Public
Law 108-446, 2004; Washington, District of Columbia.

Zabala, J. (2005). Ready, SETT, go: Getting started with the SETT framework.
Closing the Gap Solutions, 23(6), 1-3.

ASSISTIVE TECHNOLOGY REFERENCES AND PRICING

CommonLit: An extensive digital library offering free and accessible leveled literacy materials for grades 3-12; available from https://www.commonlit.org at no cost.

DocsPlus Software and applications available from https://www.cricksoft.com/us/docsplus; variable pricing contingent on school licensing agreements. FREE 28 day trial. Single computer license: $495.00, OneSchool license for 10 computers: $1500.00, OneSchool Flexi-license, unlimited computers, $4500.00. One year site license for Chromebooks, $800.00.

Google Classroom: A web-based, digital classroom management system developed by Google to streamline sharing files between teachers and students; available from https://classroom.google.com/ at no cost. ■

MYSTIC LAKE
CENTER

Assistive Technology in Special Education, Rehabilitation and Everyday Living

37th ANNUAL CONFERENCE

SAVE THE DATE Plan To Attend!

Closing The Gap
OCTOBER 2-4, 2019
Preconference Workshops
Monday and Tuesday,
September 30 - October 1, 2019
PRIOR LAKE, MINNESOTA

Mystic Lake Center

The Mystic Lake Center is the newest addition to Mystic Lake Casino Hotel – the only full-service resort in the Minneapolis/Saint Paul area. With the addition of 180 hotel rooms in a stunning new tower, this brand new Mystic Lake Center joins Mystic Lake Casino Hotel to form the second-largest hotel in the Minneapolis/Saint Paul area.

Guests will experience luxury, modern amenities and sweeping west-facing golf course views as one of the first guests in the new Promenade Tower — adjacent to the new Mystic Lake Center and everything Mystic Lake has to offer. It's all just steps away from restaurants, bars and nonstop entertainment. Learn more.

Mysitc Lake Center
2400 Mystic Lake Blvd.
Prior Lake, MN 55372

PLAN NOW TO JOIN US IN 2019!

Join us for the 37th Annual Closing The Gap Conference and return home with knowledge and tools to implement all that is gained!
Through shared best practices and research, networking, training, hands-on opportunities and an expansive exhibit hall, conference participants will find information, strategies and products that prove beneficial and, oftentimes, unsurpassed for use in their work and in their lives.

WHO SHOULD ATTEND?

Anyone interested in finding practical and readily available AT solutions for ALL disabilities, mild to significant, infant through adult.

✔ SPEECH LANGUAGE PATHOLOGISTS
✔ OCCUPATIONAL THERAPISTS
✔ AT CONSULTANTS
✔ TECHNOLOGY SPECIALIST
✔ AUTISM SPECIALIST

✔ SPECIAL EDUCATORS
✔ SPECIAL EDUCATION DIRECTORS
✔ ADMINISTRATORS
✔ PHYSICAL THERAPIST
✔ UNIVERSITY INSTRUCTORS

This year's conference will build on a tradition of providing a comprehensive examination of the most current uses of technology by persons with disabilities and the professionals who work with them.

Topics will cover a broad spectrum of technology as it is being applied to all disabilities and age groups in education, rehabilitation, vocation, and independent living.

Come and learn, first-hand, about the best AT products, practices and strategies used by teachers, therapists, clinicians, parents and end users alike.

2019

37TH ANNUAL CLOSING THE GAP

October 2-4, 2019

Preconference Workshops: September 30 - October 1

Prior Lake, Minnesota

Registration detail, including, group, student and parent discounts... CLICK HERE!!

DISKoveries

Playing to Learn:
Toys, Smart Toys, and
Play & Learn with the iPad

By Joan Tanenhaus

Once again, a collection of toys that focus on play, fun and learning. They are designed to encourage language and communication, thinking skills and creative play while also setting a context for turn-taking and social skills. Have fun playing and learning.

LITTLE PEOPLE BIG HELPERS HOME (FISHER-PRICE: HTTPS://FISHER-PRICE.MATTEL. COM/SHOP/EN-US/FP/LITTLE-PEOPLE-HOUSE-TOWN-CAR/LITTLE-PEOPLE-BIG-HELPERS-HOME-FHF34)

Another wonderful Little People toy, a playhouse designed for exploratory and pretend play. This house, available in pink or blue, has many rooms and areas to explore, along with easy-to-grasp Little People "friends" Emma, Jack and Dog included, too. As they begin their imaginative play, children hear songs, sounds and phrases that encourage them to help around the house, information about caring for pets, and ways to develop healthy habits. They can press buttons, open doors, turn on lights, move sliders and hear sounds and songs. They can feed the dog, make the bed, have Emma go up and down the steps, give Jack a bath in the tub, flush the toilet, put away toys and more. There are songs that introduce teamwork, playing together, helping, healthy habits, morning routines and household chores. If you want, you can also add other little people (Little People Big Helpers Family Figures (sold separately) include mom, dad and baby.) The house opens for play time and then packs away easily with all the furniture and Little People inside. The handle on top makes it easy to carry and take along to a friend or to family. Excellent for young children for symbolic play, language development and social skills. Also great to use in a therapy session, classroom setting or at home. It links with other Little People playsets and is an open-ended, exploratory toy for pretend play and for the development of language and social skills for young children.

To help you relate this early learning to other play situations, Fisher Price has some excellent apps for learning as well as videos and other web resources. Also there are some fun apps for

BACK TO CONTENTS

Fisher-Price: Little People Big Helpers Home: YouTube Video Link:: https://www.youtube.com/watch?v=Dm1riHmiZmk

Vehicle Playsets: Jinja's Jet (www.sagomini.com)

your iPad and Android tablets that encourage pretend play related to house and home:

Apps:
- My Town: Home Doll House (www.my-town.com)
- Toca House (www.tocaboca.com)
- My PlayHome (www.myplayhomeapp.com),
- My Town: Grandparents (www.my-town.com)
- Pepi House (www.pepiplay.com)
- Fisher-Price Storybooks Rhymes (www.fisher-price.com)
- Fisher Price Videos: Fisher Price Little People full episodes on YouTube.
- Fisher Price Online Games & Activities: http://play.fisher-price.com/en_US/index.html

Other: See reviews below:
- Jinja's House (www.sagomini.com)
- My Little House (www.smartfelttoys.com)

VEHICLE PLAYSETS: JINJA'S JET (WWW.SAGOMINI.COM)

Vehicle Playsets are a series of toys designed by Sago Mini, a company that has produced and created extensive products and resources that provide excellent open-ended creative play experiences with both toys and apps for young children. Sago Mini characters and apps encourage children to explore, imagine and discover. Inspired by the popular Sago Mini app Planes, **Jinja's Jet** features one of the favorite characters, Jinja the cat. For ages three and up, this toy contains the airplane, Jinja the pilot, two friends, Tom and Astrid and a group of related objects (a mini suitcase, and mini teddy bear, selfie stick, juice box, sleep mask) that all store away in the cargo hold. This toy, and others in the Vehicle Playset series are designed to promote social skills, creative and pretend play. Other sets in the series include: **Hugbot & Kiki's Fire Truck**, and **Neville's Ice Cream Truck.**

Vehicle Playsets: YouTube Video Link: : https://www.youtube.com/watch?v=ghysKBXB3Yw

For more fun with Jinja the cat, see Jinja's apps: **Sago Mini Road Trip, Sago Mini Fairy Tales** and **Sago Mini Doodlecast** (www.sagomini.com)

Sago Mini, Toca Boca and other open-ended apps related to vehicles:)

- Sago Mini Planes (www.sagomini.com)
- Sago Mini Trucks & Diggers (www.sagomini.com)
- Toca Train (www.tocaboca.com)
- Toca Cars (www.tocaboca.com)
- Duck,Duck,Moose Trucks (www.duckduckmoose.com)
- Duck Duck Moose Build-A-Truck (www.duckduckmoose.com)
- Monster Truck Doodle (www.shoethegoose.com)
- Pepi Garage (www.pepiplay.com)

- Dr. Panda Café (www.drpanda.com),
- Cake Doodle (www.shoethegoose.com)

(Please note that both the Portable Playsets and Vehicle Playsets contain small parts that are a choking hazard and are not for children under three years old.)

Jack's Diner: YouTube Video Link: https://www.youtube.com/watch?v=ku4kubobadc

Portable Playset: Jack's Diner (www.sagomini.com)

PORTABLE PLAYSETS: JACK'S DINER (WWW.SAGOMINI.COM)

Portable Playsets is another fun series from SagoMini. **Jack's Diner**, for ages three and up, features Jack the rabbit and friend Dennis the octopus, along with things you would want in your diner - booth seats, a jukebox, take-out window, washroom, mugs and bowls, paper menus and dollars and more. Play as a cook, a server or a customer! When you're all finished, everything closes up and the diner has a handle so you can carry it anywhere you want to play. Other sets in the series include: Jinja's House and Harvey's Spaceship. (Jinja's House was reviewed in detail in DISKoveries in the April/May issue of Closing The Gap Solutions.)

For more fun with Jack, the rabbit, see Jacks's apps: Sago Mini **Superhero, Sago Mini Babies** and Sago Mini **Trucks & Diggers** (www.sagomini.com)

Sago Mini, Toca Boca and other open-ended apps related to Diners, Restaurants and Cooking:

- Sago Mini Pet Café (www.sagomini.com),
- Toca Kitchen (www.tocaboca.com)
- Toca Kitchen Monsters (www.tocaboca.com),

BACK TO CONTENTS

Pillow Playset: Pillow Doctor: (www.sagomini.com)

PILLOW PLAYSETS : DOCTOR'S OFFICE (WWW.SAGOMINI.COM)

Pillow Playsets is the third group of new and creative toys from SagoMini. The toys in this group feature a throw pillow that unfolds to reveal a fun and unique play area. After play, the toy folds back up again and can be used as a pillow. As Sago says, it's "a world of play, hidden away". **Doctor's Office** is one of the three options- the white pillow is covered with black illustrations related to the theme- band aids, syringes, glasses, first aid bags, tissues, stethoscopes, clipboards and so much more. Great for playing an I Spy game! When ready to play, just unfold and spread out on the couch, or chair- and let the fun begin. Once unfolded, the Pillow Playset is three panels and you lay it out so that the child can stand and play or even climb onto the couch and sit next to it while playing. The **Doctor's Office** comes with a plush stethoscope, knee hammer, syringe and thermometer. There's a picture of Harvey the Dog, one of the Sago Mini characters, dressed in a lab coat, holding a clipboard and ready to help patients. Young children use the plush accessories to engage in creative play. There are also secret pockets which help the imaginative play- a blood pressure cuff to slip into, a flap to lift and reveal an x-ray and a pocket to tuck away medical tools when not in use. When done, just fold up again into a pillow. And it's 100% machine washable. It also becomes a great take-a-long toy. Children can use it as a pillow on a road trip and then have a fun toy to play while visiting. The others in the series are Kitchen and Doll House.

For more fun and to help reinforce and expand concepts related to the **Doctor's Office**, see the following apps:

- Toca Doctor (www.tocaboca.com),
- Toca Life: Hospital (www.tocaboca.com),
- Toca Pet Doctor (www.tocaboca.com),
- Dr. Panda Hospital (www.drpanda.com)
- Pepi Doctor (www.pepiplay.com),
- Pepi Hospital (www.pepiplay.com)

Sago Mini Pillow Playsets: YouTube Video Link:
https://www.youtube.com/watch?v=rTMBWEx0YME

My Little House (www.smartfelttoys.com)

MY LITTLE HOUSE (WWW.SMARTFELTTOYS.COM)

Designed by a speech pathologist, My Little House is the first in a series of well-designed language learning tools. It's a reversible; three-dimensional felt covered cardboard house that can be used in three different ways. First, it can be placed flat on the table or floor so you can see all four panels of the inside of the house. Flip it over and you will see the other four panels, showing the outside of the house.

The inside shows eight different rooms with the outlines of

36 objects that correspond to the 36 colorful felt pieces included with the house. The rooms are arranged with one room on the bottom of each panel and one room at the top. There's a kitchen, living room, bedroom and dining room on the first level, a baby's room, an office, a bedroom and bathroom on the top level.

The next two ways to play are created by standing the house up and folding it into a 3D house. Because of the Velcro on top and sides, this can easily be done to form a house with four walls and a four-sided roof. Open it up and re-fold it so you see the outside of the house (four walls and four-sided roof). When playing with the inside, the felt pieces can be used to match the outlines. When playing with the outside, there is plenty of space to create your own design or rooms. These 36 items have been selected to provide maximum opportunities for language development. For example, the included objects also demonstrate colors, sizes, shapes, opportunities for counting, description and narration and examples of spatial and temporal concepts.

This open-ended learning toy can be used at home, in school, by a child alone or in a group, and encourages open-ended imaginative play and social interaction. In addition to the house, My Little House comes with a box to store the house and pieces, with a convenient handle on top, making transporting easy. Also included is a pamphlet with an overview of concepts and skills you can address in play.   The second in this series, My Little Farm, just became available. Others are planned.

To help reinforce these early learning concepts in other related play situations:

Apps:
- My Town: Home Doll House (www.my-town.com)
- Toca House (www.tocaboca.com)
- My PlayHome (www.myplayhomeapp.com)
- Pepi House (www.pepiplay.com)

My Little House: YouTube Video Link:
https://youtu.be/NqzlB1A-Lv8

Other toys:
- Jinja's House (www.sagomini.com) (see above),
- Little People Big Helpers Home (www.fisher-price.com) (see above) and
- Pillow Playsets: Doll House (www.sagomini.com) (see above)

Rocktopus: (Fisher-Price: https://fisher-price.mattel.com/shop/en-us/fp/think-learn/think-learn-rocktopus-fxw98)

ROCKTOPUS (FISHER-PRICE: HTTPS://FISHER-PRICE.MATTEL.COM/SHOP/EN-US/FP/THINK-LEARN/THINK-LEARN-ROCKTOPUS-FXW98)

Rocktopus is a musical octopus that contains errorless play and some learning games using music as the focus and motivator. It encourages children to explore a variety of musical styles while learning about different instruments and rhythmic patterns. Rocktopus won the prestigious Toy of the Year Award in the Preschool category at the 2019 Toy Industry Association's Toy of the Year Awards Ceremony.

Rocktopus has eight "tentacles" to hold different combinations of the 15 musical instrument modules. On the easiest level, children just select an instrument module, insert it into the tentacle, and press to hear it named and played briefly. If they want to hear more complex music, they can enter the "Mix and Match Music" mode, and add up to four instruments to hear them played together and to make the music go faster or slower. It's simple exploratory play that encourages children to listen to a variety of musical instruments, and to make errorless choices. In the Musical Math game, children follow spoken instructions such as "hand me some instruments, hand me three instruments, take away two instruments, take away all four instruments, etc." As children place and remove instruments in the tentacles, the toy reinforces the math concepts – "Now I have

BACK TO CONTENTS

two instruments. One plus one equals two." Children are guided to add and take away the correct amounts. In the Bop and Rock game mode, children follow directions to keep the lights a particular color. They are guided to "bop the instruments" that change color. Within the classroom, Rocktopus offers opportunities to encourage turn taking and group play, as well as independent play.

There is a free app in the App Store and in Google Play that lets you create your own music video. Very simple and highly related to the toy, the app lets users pick a location (from three choices), pick type of music (rock, pop, etc.), add a selfie and brief message, then select three instruments, touch to play solos and record. Videos can be edited, saved or deleted. This makes for an easy, fun and personalized follow-up activity.

As discussed, there will be another review here- Sphero Mini Robot- with graphic, review and video link. I expect to receive the toy during the week of Feb. 18 and will send the review to you, I expect, during the following week. I'll get it done as fast as I can

Rocktopus: YouTube Video Link:
https://www.youtube.com/watch?v=_okOQZvkung

SPHERO MINI ROBOT
(WWW.SPHERO.COM/SPHERO-MINI, WWW.SPHERO.COM/EDUCATION/)

This amazing app-enabled mini-robot is the size of a ping-pong ball, and, when controlled by your iPhone, iPad, or your Android devices, it has 7 different driving modes, 3 games, coding activities and so much more. Available in a variety of colors, its colorful shell encases a small robotic device that includes a gyroscope, accelerometer, and LED lights. Although designed for ages 8 and older, the Sphero Mini Robot has many fun and educational applications for younger children as well.

On the easiest level, players can move their Mini around using 7 driving modes which are displayed on their device. With Joystick mode, they just touch the big circle on screen and drag it in any direction to move the mini around. In Slingshot mode, players pull back on the circle and release to drive (in any direction in a straight line). In Tilt mode, they tilt the device in any direction to drive; in Kick mode, they flick the on-screen ball to kick--tap to trap it and curve to swerve it. In Golf mode, they use their device like a golf club and swing. Two additional modes are Face Drive and Scream Drive. In Face Drive, you hold the device up so your face is on screen- use a smile, a frown, a smile and tilt, or a wink to drive in the directions you choose. Smile goes forward, a frown backward, etc.) In Scream Drive, you touch and drag to steer and scream at different levels to accelerate and slow down. What a motivating way to reinforce facial expression,

voice control and to practice fine motor skills! (See link below to watch how each of these modes work.)

The settings area lets you control the LED color, the brightness, the maximum speed of the robot, music and volume. In addition, Sphero is known to continually update their robots and apps, adding functionality and new features all the time.

To charge the robot, you need to open the outer shell, plug in the mini USB cable (included) and connect to a power source. It will then pair easily with your device over Bluetooth. The original packaging is an excellent way to store the Mini. Since the robot is small and can roll around, this is very helpful, especially in an active classroom or a busy household.

Those 7 driving modes would be enough to highly recommend this robot, but there is so much more. There is the included set of mini bowling pins and cones that you can set up in any configuration you want. Drive the Mini to go through an obstacle course or to knock down the pins in a game of bowling. There are three games to play on your device using the Mini like a joystick controller (for older users). You can also download the Sphero Edu app which provides an introduction to programming. The app contains lessons for various ways to program the robot- Draw (for beginners), Blocks (for intermediate coders) and Text (for learning to use JavaScript to write text programs). With Blocks, you can just drag and drop blocks of code, modify numbers if you want, and watch how the change alters the program. The Mini is an excellent choice for classroom learning and exploration or for use at home for motivating and challenging educational fun. Look for reviews in the future of some other outstanding Sphero products.

Sphero Mini Robot: YouTube Video Link:
https://www.youtube.com/watch?v=D4XBH5ggq-w&t=63s

MARBOTIC
(WWW.MARBOTIC.COM)

Marbotic is the company that brought us **Smart Letters** and **Smart Numbers**, sets of 26 high quality wooden upper case letters and 10 numbers that work together with a group of excellent, free literacy apps and with the iPad2 and later. The front of each letter has a metal handle that makes it easy to grasp and press. The back of each has here small rubber-like "feet", all in varied spots that identify them as particular letters or numbers when they are placed on the screen. A full review of Smart Letters and Smart Numbers and all the Marbotic apps appeared in DISKoveries in the April/May 2017 and the June/July 2018 issues of Closing the Gap Solutions magazine. **New from Marbotic**:

DELUXE LEARNING KIT
(WWW.MARBOTIC.COM)

Marbotic Deluxe Learning Kit: (www.marbotic.com)

The new **Deluxe Learning Kit** contains a set of three wooden puzzle trays, containing the 26 lower case letters and the numbers 0-9 in a sturdy, well-constructed wooden case. The first tray has the letters a-m, the second has n-z, and the third holds the numbers 0-9. All the apps now work with both lower and upper case letters. The Deluxe Learning Kit is a great way to keep the letters and numbers together, while at the same time offering an alphabet puzzle play experience. An excellent classroom addition, it also reinforces organizational skills and helps with alphabetical sequencing.

BACK TO CONTENTS

Coming Soon: Marbotic has announced the production of a new co-branded product with Educo (www.educo.com) called Magic Phonics. It consists of interactive wooden letters that interact with tablets. A dedicated app will introduce letter/sound correspondences to help reading skills. More information as it becomes available.

Marbotic Deluxe Learning Kit: (www.marbotic.com)

Marbotic's Deluxe Learning Kit: YouTube Video Link: https://youtu.be/3PG8gdeD2ME

OSMO (WWW.PLAYOSMO.COM)

Osmo is an award-winning game system that has created new ways for children to play, learn and interact with the iPad. DISKoveries has included reviews of Osmo since it first came out in 2014. These games have included **Tangram, Words, Masterpiece, Newton, Numbers, the Coding Family (Codie Awbie Game, Coding Jam Game, Coding Duo), Pizza Co. Game and Mind Racers.** (See DISKoveries in CTG Solutions 2015-August, 2016-April and 2018-June).

The Osmo system comes with a tablet stand and a reflective mirror. The mirror is a red attachable piece that lets the tablet see the environment below and in front of it and translates movements to the device. Osmo is now available for the iPad version 2 or higher, for Amazon Fire Tablets, and for the iPhone. (Games are sold separately.) **New from Osmo:**

Osmo Detective Agency: (www.playosmo.com)

OSMO DETECTIVE AGENCY (WWW.PLAYOSMO.COM)

This is another fun and creative learning game from the developers of Osmo. Those of you who are familiar with the old Carmen Diego software series will immediately be familiar with this game. Players, ages five and up, run their own detective agency and play as detectives whose job is to solve a crime by traveling from place to place, following clues and tracking down the criminal. Included in the box is a magnifying glass, a map holder box and four double sided folded cardboard maps. Each of the maps has a small tab with a visual symbol, signifying the maps location (i.e. Cairo, Rio de Janeiro, Sydney, Paris, New York,

Osmo Detective Agency: YouTube Video Link:
https://www.youtube.com/watch?v=4OL6Vq1CfLg

Beijing, Osmo Town and the World.) The maps are full of graphics of the city's landmarks and other features and city objects (i.e., New York has the Statue of Liberty, the Empire State Building, street signs for Wall St., 53rd St., bridges, cars, buses, boats, post office, pizza restaurant, and so much more.) It's a real "I Spy" type of task finding the locations/objects needed. When the thief and missing object is identified, the player takes out the corresponding map (given as a visual clue) and given a series of spoken clues: different buildings, characters, objects, etc. Hints are available. Famous landmarks are often shown as actual pictures, with some basic facts spoken.

There are several different kinds of clues- match a picture exactly; find a clue that matches the shape of the clue; find a colorful clue that matches a black and white picture; find a clue that looks like the picture; find as many clues that you can that match the picture; find a clue that matches the text description; find a clue that fits all of the descriptions and find all of the three clues. When you find the object, you place the map so that the picture is in front of the tablet, and then put the magnifying glass over the object. That helps the app recognize the picture. Players will continue to follow a series of clues to catch the thief and find the stolen object.

Some of the options available include the ability to mute the background music, to auto read clues and text and to disable timers on all clues with time limits. There is an office and desk to meet the characters, look at the case files and see case rewards. Like other Osmo programs, this is an excellent and motivating game that will encourage players to problem solve, explore social studies, work on figure-background and visual scanning skills while also learning as they are having fun.

Osmo Super Studio: (www.playosmo.com)

OSMO SUPER STUDIO (WWW.PLAYOSMO.COM)

Each of the Super Studio games from Osmo, for ages five and up, contains an iPad app with a Super Studio sketchpad that has reusable pages, a Super Studio marker and a cloth for wiping off the pages when completed. When users put the sketchpad in front of the iPad with Osmo base and reflector, the app recognizes it and will guide them through illustrating an interactive storybook, sketch lessons and other activities. They add their own artwork to the story, or if they want, they can get tips and suggestions. When each page is completed, their artwork will appear on the screen and animate. In **Super Studio Mickey Mouse and Friends**, there are six stories to animate, with Mickey, Minnie, Pluto, Donald, Goofy, Daisy and others. Each page has a picture with at least one area left incomplete. For example, there's Mickey without the outline of his face and ears, Daisy without her bow, her dress and something she's carrying and there's Pluto without his ears and nose. **Super Studio Disney Princess** has six more stories (33 pages) starring Ariel, Belle, Rapunzel, Lumiere, Cogsworth and many others. The third game in the series is **Super Studio Incredibles 2**, which has characters Mr. Incredible, Elastigirl, Violet, Jack and others. In all of the games, a narrator tells the story of each page. Users are encouraged to fill in the highlighted areas, using the included purple marker to draw the suggested objects and a choice of six colors to then fill in their drawings. (If they want to color in themselves, they can purchase different colored markers separately from

BACK TO CONTENTS

Osmo Super Studio: YouTube Video Link:
https://www.youtube.com/watch?v=gtz64nKDP1w

Osmo.) After the page is complete, their picture will animate and become part of the story. There are options to turn off background sound and to reset progress and begin again. Users are guided along with much support and praise and reminded to erase each page before moving on, so the book is ready to be used again. Children don't have to finish the story in one sitting- they can return to complete all the drawings anytime. Following the story, there is also a "Learn to Draw" activity, with guided step-by-step learning. These new well-done Osmo programs are good for many learning skills – visual perception, visual-motor coordination, motor planning, following directions, understanding new vocabulary in context, sequencing skills and attention and focus.

Joan Tanenhaus, M.A., CCC, Speech-Language Pathologist/ Assistive Technology Specialist, is Founder and Executive Director of Technology for Language and Learning, Inc., a non-profit organization dedicated to advancing the use of computers and technology with children and adults with Special Needs. (e-mail: ForTLL@aol.com) ■

Closing The Gap CALL FOR PARTICIPATION

SUBMISSION DEADLINE:
THURSDAY, APRIL 25, 2019

www.closingthegap.com/call-for-participation-2019/

PART 2: Better Assistive Technology Decision Making Through Research

In the first article of this two-part series, I briefly reviewed some of the major findings in research about AAC, power mobility and AT for individuals with significant cognitive disabilities. In this second part, the focus is on research about the use of AT to support reading and writing for students with high incidence disabilities.

AT FOR READING FOR STUDENTS WITH HIGH INCIDENCE DISABILITIES

Traditional Reading Instruction is designed to support readers' ability to decode and make the connection between the sounds heard and letters read. It leaves behind a group of students who may never achieve an adequate level of speed, fluency and accuracy. And it leaves the struggling reader with little to no energy or capacity left to figure out the word, make sense of it, and then do something with it (i.e., comprehend or respond) (Hirsch, 2003). About 90% of students with learning disabilities (LD) have significant difficulties in literacy (Vaugh, Linan-Thompson, & Hickman, 2003). These students are more likely than their peers to be disengaged from the learning process and to subsequently drop out of school (Seo, Brownell, Bishop, & Dingle, 2005).

AT TO SUPPORT READING

Text-to-speech (TTS) software is the most common AT used for students struggling with reading. It works well for some, but not all. It must be tried for multiple sessions to see if it will make a difference. Programs have varying features, including reading rate, voice type, document tagging (which affects reading order) and dynamic highlighting, so some experimenting to find the best match may be required.

There is a learning curve to using TTS, not just its operation, but how to make it work effectively for the individual student. Some students with similar disabilities may be more skilled at decoding than others and may benefit differently from TTS. Some may have additional diagnoses, such as attention deficit/hyperactive disorder, which may affect their reading performance. In addition, personality and social factors interact with each student's disability and may either facilitate or inhibit TTS use. TTS increases vocabulary, increases reading speed and provides exposure to correct pronunciation. In two studies Stodden, Roberts, Takahishi, Park, & Stodden (2012) found that TTS needs to be used for at least 40 minutes per week for one semester. They postulated that its use allows more room in active memory for constructing meaning and leaves students less fatigued.

One interesting finding about TTS is that students may feel they finish reading tasks more quickly and read more fluently even when they don't (Meyer & Bouck, 2014). This may be related to feeling less fatigued after using TTS to access text. Additionally, TTS allows students to customize viewing, interacting and pacing of the text. These enhance student engagement, interest and motivation (Reinking, 2005; Strangman & Dalton, 2005). Using TTS doesn't mean that students don't need to be skilled readers; it means the computer has become their decoding eyes. Parr (2013) points out that they must then: add expression, reread with fluency, create pictures in their mind, make connections and make sense of it.

The Iowa Text Reader Longitudinal study of TTS (Hodapp & Rachow, 2010) found students accessed the computer passages using TTS at 160 words per minute, while they read paper probes at 79 words per minute. The researchers alternated conditions (TTS vs. paper book) each week on probes to eliminate

DR. PENNY REED is an independent consultant who provides consultation and training on a variety of topics related to assistive technology with a special focus on helping school districts improve their delivery of assistive technology services. She is the author of numerous publications about assistive technology services. She can be reached at 1happypenny@gmail.com.

BACK TO CONTENTS

the effect of bias. When using TTS, students accessed twice as much text within the same amount of time. In the second year of the study, students were able to access twice as much information with improved comprehension, even when material became more difficult. The use of the TTS allowed students to demonstrate improved comprehension scores on factual and inferential (higher level thinking) comprehension questions and the students moved to more fluid use more quickly the second year (week 7 vs. week 11). Their comprehension also improved. Teachers reported improved academic performance, better on-task behavior and more engagement when using TTS.

Wood, Moxley, Tighe, & Wagner (2017) completed a definitive meta-analysis of studies of TTS. They excluded students without identified LD and included single subject design studies. They found the use of TTS significantly increased reading comprehension for students with learning disabilities.

Although Moorman, Boon, Keller-Bell, Stagliano and Jeffs (2010) found that TTS increased reading rate and comprehension for two students with learning disabilities, TTS alone is usually not enough. Training is still needed in comprehension because students may have missed the opportunity to learn and practice comprehension skills in the past when they were struggling to decode text. It can help them to think aloud about how to self-question and reflect during and after reading. It has also been found to help when students are actively involved in monitoring their understanding and processing text meaning (Edmonds, Vaughn, Wexler, Reutebuch, Cable, Tackett, & Schnakenberg, 2009). Use of TTS should be paired with comprehension strategy training and must be used for a long enough time period for the student to become skilled in its use before expecting to see results. It is best to talk with each student about how it is working/not working for him or her.

Parr (2013) reviewed the research on TTS and suggests that it appears to work best for students with:

- Slow or inaccurate decoding that is below their cognitive and intellectual potential (i.e., less than 90% accuracy);
- Lower levels of fluency, (i.e., less than 92 words per minute);
- Good listening comprehension that can be stimulated by TTS;
- A reluctance to read due to low levels of confidence and/or internal motivation;
- Pacing and attentional difficulties that can be accommodated or regulated by TTS; and
- Those who often require multiple readings of assigned text.

OTHER AT TO SUPPORT STUDENTS STRUGGLING WITH READING

Graphic Organizers can help students take notes, improve comprehension of content, make connections within and between information and participate more in class (Strangman, Vue, Hall & Meyer, 2004; Gajria, Jitendra, Sood, & Sacks, 2007). In a thorough review of research Manoli and Papadopoulou (2012)

concluded that students with learning disabilities who had the lowest abilities were helped the most by their use.

Even the use of E-books has been shown to be beneficial for some students with disabilities because they allow changes of font size that may significantly increase legibility for them. Siegenthaler, Wurtz, & Groner, (2011) collected eye-tracking data on participants and found a significant decreased fixation on the text when compared to paper books, they found the decreased time of fixation represented an increase in legibility for those students.

While some studies have found the use of audio books can improve comprehension when compared to reading (Boyle, Rosenberg, Connelly, Washburn, Brinckerhoff, & Banerjee, 2003) other studies suggest it is possibly better suited to recreational reading than text book reading. Daniel & Woody (2010) had students without disabilities listen to podcasts or read a text book. Students initially reported preferring to listen, but on a test two days later the listeners scored 59% while the readers scored 81%. Student's individual preferences and abilities affect the utility and effectiveness of AT for reading.

AT FOR WRITING FOR STUDENTS WITH HIGH INCIDENCE DISABILITIES

65% of students referred for learning disabilities have a writing disability (Mayes, Calhoun, and Crowell, 2000). Smith and Okolo (2010) reviewed the National Assessment of Educational Progress (2009) and noted that only six percent of students with disabilities scored at a proficient level on writing tests. 46% scored below basic level, and 48% performed at basic level. Students with LD are more likely to have errors in spelling, punctuation, capitalization and word usage. Their writing is more likely to be shorter and illegible (DeLaPaz, 1999).

Personal computer spell checkers, digitized text, word prediction software, speech recognition and alternative writing tools are the most common computer features used in schools to facilitate writing (Cullen, Richards, & Lawless-Frank, 2008; Barbetta & Spears-Bunton, 2007). Compared to handwriting, even word processing makes a difference. Hetzroni & Shcreiber (2004) found that students had fewer spelling errors, fewer reading errors and improved organization and structure when using the computer. MacArther, Graham, Schwartz, and Schafer (1995) found that improved performance depends on how well students are trained to use the features.

Batorowicz, Missiuna, & Pollock, (2012) did a very thorough review of the research on AT for writing. They looked at word processing software, spell checkers, word prediction, speech recognition, concept mapping/organizing software and multimedia. Although the studies are limited, they suggest a positive influence on quality of written text, organization, transcription and revising. AT combined with instruction yields the most positive results. Collaborating with peers when using technology appears beneficial for both composing and revising. They deter-

mined that technology motivates children and enhances their opportunities to practice writing.

WORD PREDICTION

The term word prediction may include both word completion (guessing the remainder of a word based on the first letter or two) and true word prediction (guessing the next word based on the current word) aspects. Studies of word prediction software prior to 2003 did not have phonetic spelling, so word prediction was less accurate. However, even older studies showed benefit. Word prediction alone and in combination with TTS have had a positive impact on the written output of students with identified learning disabilities (Silió & Barbetta, 2010; Cullen, Richards, & Lawless-Frank, 2008; Tam, Archer, Mays, & Skidmore, 2005). Most studies look at number of words written, spelling accuracy and writing rubric scores (including total unit length).

GRAPHIC ORGANIZERS TO SUPPORT WRITING

Studies of the use of graphic organizers as AT for writing show increases in number of words written, amount of time spent on planning and common story elements (Blair, Ormsbee, & Brandes, 2002; Sturm & Rankin-Erickson, 2002; Unzueta & Barbetta, 2012; Gonzalez-Ledo, Barbetta, Unzueta, 2015). Changes in overall organization of the written product were found in some, but not all of these studies. In addition, electronic graphic organizers allow educators to change the visual representation of the images and text, convert the information in a concept map to an outline, and add audio and text and allow students to manipulate text, alternate between concept map and outlining, and insert information. Englert, Wu, and Zhao (2005) found that the 12 students in their study performed significantly better when using the graphic organizer than without it. Sturm and Rankin-Erickson (2002) found students demonstrated a more positive attitude to the computer based graphic organizer than to the hand drawn graphic organizer or a no organizer condition.

SPEECH RECOGNITION

In several studies the use of speech recognition produced passages with more words and fewer errors than handwritten passages (Quinlan, 2004; MacArthur & Cavalier 2004; McCullum, Nation, & Gunn 2014). However, the use of speech recognition requires the ability to plan phrases and sentences and to dictate without stopping to correct every error (Cullen, Richards, & Lawless-Frank, 2008). It has a large impact for some, but not all, students. McCullum, Nation, & Gunn (2014) looked at total words, total multisyllabic words and correct writing sequences. They determined writing sequences by looked at every pair of words. For some students, changes were dramatic, going from writing 18 words in the pre-test to 118 in the post-test. For others, the performance changes were much smaller. Speech recognition is particularly beneficial for those whose oral skills are stron-

ger than their writing skills (Li & Hamel, 2003). A good guide is *Speech Recognition as AT for Writing* (Cochrane & Key, 2014). It can be downloaded from http://pub.lucidpress.com/2f091482-82da-44a9-b8da-0f9c52f81482/

One of the most compelling reasons to provide AT to students with disabilities comes from comparing postsecondary outcomes of students with high incidence disabilities who reported receiving AT in high school to those who reported not receiving AT (Bouck, E., 2106). Bouck analyzed the data from the National Longitudinal Transition Study-2. She found that 99.8% of the students who received AT graduated versus 79.6% of those who did not receive AT. 80.9% of students who received AT attended a post-secondary institution compared to 40.1% of students who did not receive AT. 80% of those who received AT had a paying job after high school, while only 50.8% of those who did not receive AT had a paying job at the time of the study. While this data does not show a causative relationship, because there is no way to know if there were other significant differences in services or abilities, it does provide a picture of the broad impact of AT use for at least some students with disabilities.

FINDING AT RESEARCH

Look for research articles in peer-reviewed professional journals such as Augmentative and Alternative Communication-www.isaac-online.org/en/publications/aac.html, Assistive Technology-www.resna.org, Journal of Research on Technology in Education- www.iste.org, or the Journal of Special Education Technology-https://journals.sagepub.com/home/jst. Then compare to find the "best evidence", evaluate the applicability of research to your situation, then use it to make better decisions. Finding a meta-analysis of multiple studies can be very helpful because it gives you an overview of the findings on a specific topic.

The material I have included in this two-part series can be found on the National Assistive Technology in Education (NATE) Network website under the AT Research section- https://www.natenetwork.org/. I will periodically update that section, so you can check there for more information. The NATE network website is also currently developing a section of information for AT Teams that will include both research and resources, so keep checking there for useful tips and ideas.

REFERENCES

Barbetta, P. M. & Spears-Bunton, L. A. (2007). Learning to write: Technology for students with disability in secondary inclusive classroom. The English Journal, 96(4) 86-93.

Batorowicz, B., Missiuna, C. A., & Pollock, N. A. (2012). Technology supporting written productivity in children with learning disabilities: A critical review. Canadian Journal of Occupational Therapy, 79(4), 211-224.

Blair, R. B., Ormsbee, C., & Brandes, J. (2002, March). Using writing strategies and visual thinking software to enhance the

written performance of students with mild disabilities. In No Child Left Behind: The Vital Role of Rural Schools, 22nd Annual National Conference Proceedings of the American Council on Rural Special Education (ACRES). Reno, NV: ERIC Clearinghouse on Disabilities and Gifted Education. ERIC Document Reproduction Service No. ED463125.

Bouck, E. (2106). A National Snapshot of Assistive Technology for Students with Disabilities. Journal of Special Education Technology, 31(1).

Boyle, E. A., Rosenberg, M.S,, Connelly, V.J., Washburn, S.G., Brinckerhoff, L.C., & Banerjee, M. (2003). Effects of audio texts on the acquisition of secondary-level content by students with mild disabilities. Learning Disabilities Quarterly, 26, 203-214.

Cochrane, D. & Key, K. (2014). Speech Recognition as AT for Writing. Downloaded from http://pub.lucidpress.com/2f091482-82da-44a9-b8da-0f9c52f81482/

Cullen, J., Richards, S. B., & Lawless-Frank, C. (2008). Using Software to Enhance the Writing Skills of Students with Special Needs. Journal of Special Education Technology, 23(2), 33-43.

Daniel, D.B. & Woody, W.D. (2010). They hear, but do not listen: Retention for podcasted material in a classroom context, Teaching of Psychology, 37(3), 199-203, DOI: 10.1080/00986283.2010.488542

DeLaPaz, S. (1999). Composing via dictation and speech recognition systems: Compensatory technology for students with learning disabilities. Learning Disabilities Quarterly 22(3), 173-182

Edmonds, M.S., Vaughn, S., Wexler, J., Reutebuch, C., Cable, A., Tacket, K., & Schnakenberg, J.W. (2009). A synthesis of reading interventions and effects on reading comprehension outcomes for older struggling readers. Review of Educational Research, 79, 262-300.

Englert, C.S., Wu, X., & Zhao, Y. (2005). Cognitive tools for writing: Scaffolding the performance of student through technology. Learning Disabilities Research and Practice 20(3), 184-198.

Gajria,M., Jitendra, A.K., Sood, S., & Sacks, G. (2007). Improving comprehension of expository text in student with LD: A research synthesis. Journal of Learning Disabilities, 40(3), 210-225.

Gonzalez-Ledo, M., Barbetta, P.M., Unzueta, C. (2015). The Effects of Computer Graphic Organizers on the Narrative Writing of Elementary School Students with Specific Learning Disabilities. Journal of Special Education Technology, 30(1), 29-42.

Hetzroni, O.E. & Schreiber, B. (2004). Word processing as an assistive technology tool for enhancing academic outcomes for students with writing disabilities in the general classroom. Journal of Learning Disabilities 37(2). 143-154.

Hirsh, E.D., Jr. (2003). Reading comprehension requires knowledge – of words and the world: Specific insights into the fourth grade slump and the nation's stagnant comprehension scores. American Educator, Spring, 10–29.

Hodapp, J. B., & Rachow, C. (2010). Impact of text-to-speech software on access to print: A longitudinal study. In S. Seok, E.E. Meyen, & B. DaCosta (Eds.) Handbook of research on human cognition & assistive technology (pp. 199-219).

Li, H., & Hamel, C. M. (2003). Writing issues in college students with learning disabilities: A synthesis of the literature from 1990 to 2000. Learning Disability Quarterly, 26(1), 29-46.

MacArthur, C. A., & Cavalier, A. R. (2004). Dictation and Speech Recognition Technology as Test Accommodations. Exceptional Children, 71(1), 43-58.

MacArthur, C.A., Graham, S., Schwartz, S.S., & Schafer, W.D. (1995). Evaluation of a writing instruction model that integrated a process approach, strategy instruction, and word processing. Learning Disability Quarterly 18(4), 278-291.

Mayes, S. D., Calhoun., S. L., & Crowell, E. W. (2000). Learning Disabilities and ADHD: Overlapping Spectrum Disorders. Journal of Learning Disabilities, 33(5), 417-424

McCollum, D., Nation, S., & Gunn, S. (2014). The effects of a speech-to-text software application on written expression for students with various disabilities. National Forum of Special Education Journal, 25(1), 1-13.

Meyer, N.K. & Bouck, E. (2014). The impact of text-to-speech on expository reading for adolescents with LD. Journal of Special Education Technology 29(1). 21-33.

Moorman, A., Boon, R.T., Keller-Bell, Y., Stagliano, C., & Jeffs, T. (2010). Effects of text-to-speech software on the reading rate and comprehension skills of high school students with specific learning disabilities. Learning Disabilities: A Multidisciplinary Journal, 16(1), 41-49.

Parr, M. (2013). Text-to-Speech Technology as Inclusive Reading Practice: Changing Perspectives, Overcoming Barriers. LEARNing Landscapes 6(2), 303-322.

Quinlan, T. (2004). Speech Recognition Technology and Students With Writing Difficulties: Improving Fluency. Journal of Educational Psychology, 96(2), 337.

Reinking, D. (2005). Multimedia learning of reading. In R. E. Mayer (Ed.), The Cambridge handbook of multimedia learning, 355–376. New York: Cambridge University Press.

Seo, S., Brownell, M., Bishop, A., & Dingle, M. (2005). An examination of beginning teacher instruction in special education instructional reading practices that result in student engagement. Retrieved from http://www.coe.ufl.edu/copsse/docs/Engagement-LDW/1/Engagement-LDW.pdf

Siegenthaler, E., Wurtz, P., & Groner, R. (2011). Improving the usability of e-book readers. Journal of Usability Studies, 6(1), 25-38.

Silió, M. C., & Barbetta, P. M. (2010). The effects of word prediction and text-to-speech technologies on the narrative writing skills of Hispanic students with specific learning disabilities. Journal of Special Education Technology, 25(4), 17–32.

Smith, S. J., & Okolo, C. (2010). Response to intervention and evidence-based practices: Where does technology fit? Learning Disability Quarterly, 33, 257-272.

Stodden, R.A., Roberts, K.D., Takahashi, K., Park, H.J. & Stod-

den, N. J. (2012). Use of text-to-speech software to improve reading skills of high school struggling readers. Procedia Computer Science, 14, 359-362.

Strangman, N. & Dalton, B. (2005). Using technology to support struggling readers: A review of the research. In D. Edyburn, K. Higgins, & R. Boone (Eds.), The handbook of special education technology research and practice (pp. 545-569), Whitefish Bay, WI: Knowledge by Design.

Strangman, N., Vue, G., Hall, T., & Meyer A. (2004). Graphic Organizers and Implications for Universal Design for Learning: Curriculum Enhancement Report. Wakefield, MA: National Center on Accessing the General Curriculum. (Links updated 2014). Retrieved [February 14, 2019] from http://aem.cast.org/about/publications/2003/ncac-graphic-organizers-udl.htmlSturm, J. M., & Rankin-Erickson, J. L. (2002). Effects of hand-drawn and computer-generated concept mapping on the expository writing of middle school students with learning disabilities. Learning Disabilities Research & Practice, 17(2), 124-139.

Tam, C., Archer, J., Mays, J., & Skidmore, G. (2005). Measuring the outcomes of word cueing technology. Canadian Journal of Occupational Therapy, 72(5), 301–308.

Unzueta, C., & Barbetta, P. (2012). The effects of computer graphic organizers on the persuasive writing of Hispanic middle school students with specific learning disabilities. Journal of Special Education, 27, 15-30

Vaughn, S., Linan-Thompson, S., & Hickman, P. (2003). Response to instruction as a means of identifying students with reading/ learning disabilities. Exceptional Children, 69, 391–409.

Wood, S.G., Moxley, J.H., Tighe, E.L., & Wagner, R.K. (2017). Does use of text-to-speech and Related read-aloud tools improve reading comprehension for students with reading disabilities? A meta-analysis. Journal of Learning Disabilities, 51(1), 73-84. ∎

product spotlight

HUMANWARE – THE NEW COOKIE HAS ARRIVED IN TOWN…SAY HELLO TO THE MOST POWERFUL BRAILLE NOTE TAKER!

They are thrilled to announce the release of the BrailleNote Touch Plus, the most powerful and up-to-date braille note taker in the assistive technology industry.

BrailleNote Touch Plus is the most powerful and up-to-date note taker in the assistive technology industry packed with educational tools.
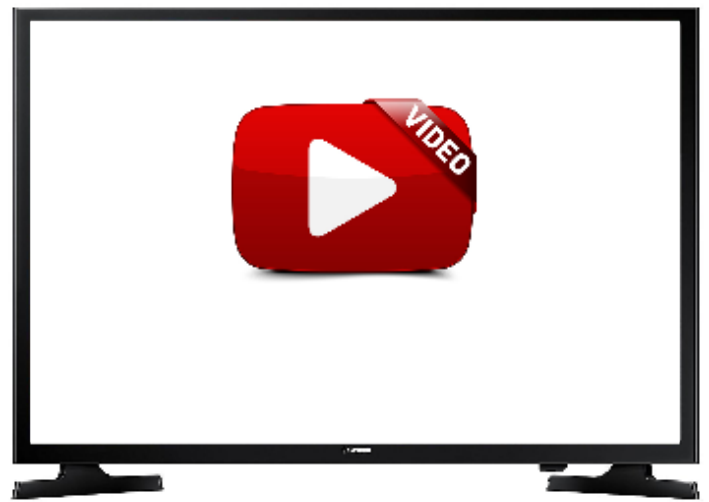
Designed to be used in the classroom, at home or at work, the revolutionary BrailleNote Touch Plus will be your guide through your life journey!

LEARN MORE

Annie – World's first Self-Learning Braille Device for the Visually Impaired

Annie enables a student to learn to read, write and type braille on their own. Through the companion app a teacher can monitor real time progress of the student, schedule tests and homeworks. Local authorities can evaluate, analyse, compare and remedy a group of students through the cloud platform.

Annie is the world's first self-learning device for Braille literacy.

Packed with gamified and interactive content, Annie makes learning braille fun.

LEARN MORE

Ablenet Sidekick and Apple AssistiveTouch

Sidekick is a mouse adapter for iPad and iPhone. Connect almost any USB Type A mouse to Sidekick, plug Sidekick into your iPad or iPhone Lighting connector, and you're ready to go!

For individuals with motor impairments that make using a Multi-Touch screen difficult, Sidekick is a game-changer for access to the iPad and iPhone! Sidekick is the first plug-and-play adapter that allows you to use almost any USB Type A mouse with your iPad and iPhone. Simply connect almost any USB Type A mouse to Sidekick, plug Sidekick into your iPad or iPhone Lighting connector, and you're ready to go!

Sidekick allows you to use almost any USB Type A mouse that has left click functionality. This includes the AbleNet Tiny-Mouse, ChesterMouse, BIGtrack, Rock Adapted Joystick, and TrackerPro (Dwell selection is not available at this time and TrackerPro will require the use of one switch to emulate left clicks).

APPLE ASSISTIVE TOUCH

Use AssistiveTouch on your iPhone, iPad, or iPod touch

You can use AssistiveTouch to control your device, help you perform gestures like a pinch, multi-finger swipe, or 3D Touch, and use Siri.

TURN ON ASSISTIVETOUCH

When you turn on AssistiveTouch, you'll see the AssistiveTouch menu. You can drag it to any edge of the screen, then tap the menu to open it.

There are a few ways to turn on AssistiveTouch:

Go to Settings > General > Accessibility > AssistiveTouch, then turn on AssistiveTouch.

Tell Siri "Turn on AssistiveTouch."

Go to Settings > General > Accessibility > Accessibility Shortcut and turn on AssistiveTouch.

When the Accessibility Shortcut is on, you can turn AssistiveTouch on or off from any screen by clicking the side button three times on your iPhone X or later. If your device has a Home button, just press the Home button three times. To adjust the Triple-click speed on your iPhone X or later, go to Settings > General > Accessibility > Side Button. To choose a click speed,

tap Default, Slow, or Slowest. If your device has a Home button, go to Settings > General > Accessibility > Home Button and choose a click speed.

LEARN MORE

TabletTable – Making Technology Accessible for Everyone!

ABOUT TABLETTABLE

They worked with teachers, therapists and parents to understand their assistive technology needs and designed TabletTable with those in mind for optimum use and minimal distractions.

TabletTable is a secure platform universally designed to make modern devices accessible and secure for everyone.

MEDICAL/THERAPY

TabletTable helps the caregiver focus on the patient, not the device.
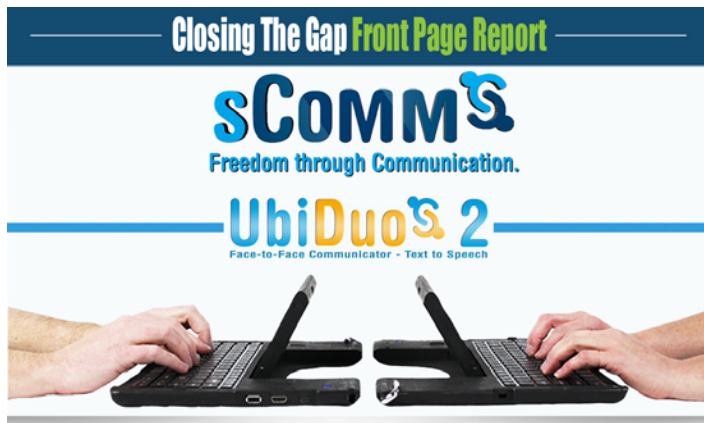
MOTOR IMPAIRED

With TabletTable 50% of users noticed an improvement in fine motor skills.

EDUCATION

Students collaborate around TabletTable rather than isolate themselves.

sComm – Bridging Gaps Between the Deaf and Hearing

ABOUT SCOMM

sComm is a worldwide leader in face-to-face communication technology for the deaf/ hard of hearing community. With the next generation UbiDuo, the privately held company continues to revolutionize the way more than 37 million Americans with hearing loss communicate with the rest of the world. sComm is relentless in its efforts to transform face-to-face communication for deaf, hard of hearing, and hearing people and will not rest until it has achieved 100% one-on-one communication equality.

THEIR STORY

The UbiDuo was born out of pure frustration. David and Jason Curry, father and son and co-founders of sComm, sat down for breakfast one morning and struggled to carry on an in-depth business conversation, free of misinterpretation and confusion. Enough was enough. David Curry came up with the idea for the UbiDuo that day, sketching on the family's kitchen whiteboard his vision for a simple, yet a revolutionary product that would forever change the way he communicated with his deaf son.

"When I saw him draw that design out I knew that was the device that was going to change the world for people who are deaf, hard-of-hearing, and hearing."

-Jason Curry, Co-founder and CEO

The family sought to make their dream a reality by obtaining two Small Business Innovation Research (SBIR) grants from the National Institutes of Health in 2005. Through the grants, they were able to test the feasibility of the product, determine if it improved face-to-face communication between deaf and hearing people, further identify product features and develop the first UbiDuo prototype. Just like that, one family's efforts to achieve meaningful and treasured personal connections through communication brought the same life-changing triumph to millions of other deaf and hard-of-hearing individuals across the world.

OrCam – Advanced Wearable AI Devices for the Blind

FOR THE BLIND AND VISUALLY IMPAIRED.

The most advanced wearable assistive technology device for the blind and visually impaired, that reads text, recognizes faces, identifies products and more.

ORCAM MYEYE 2 FEATURES

READ TEXT

Including: newspapers, books, menus, signs, product labels and screens.

EASY-TO-USE

Intuitively responds to simple hand gestures.

RECOGNIZE FACES

Real time identification of faces is seamlessly announced.

PORTABLE

Small, lightweight, and magnetically mounts onto virtually any eyeglass frame.

IDENTIFY PRODUCTS

Identification of products, enabling an independent shopping experience.

WORKS EVERYWHERE

Tiny, wireless, and does not require an internet connection.

LEARN MORE

nous – Blink to Click

BLINK TO CLICK

For people who have physical disabilities which affect all their limbs it can be difficult to control a computer.

nous™ lets people control assistive software by blinking. It is an affordable solution that is simple to use and easy to set up.

A wearable headset detects eye movements, while their software uses them to 'click' on a computer.

PEOPLE WITH ACCESS NEEDS

Combined with a headset that detects your eye-blinks, nous™ software learns your natural blinking style. Then you can use intentional blinks to control a range of assistive software applications.

Just blink to click. nous™ only uses your intentional blinks, so you can blink normally while you use it.

nous™ can help you to use computers to communicate, play games , connect with the world around you and much more.

If you are a family member or caregiver of someone who is unable to communicate or use a computer because of a disability, nous™ can help.

Combined with a computer and assistive software, nous™ acts like a switch which allows your loved one to communicate and interact through their computer.

LEARN MORE

CLOSING THE GAP SOLUTIONS - SO MUCH MORE THAN A MAGAZINE!

MAGAZINE
650+ Articles

100+ Archived Webinars
Available On Demand

Resource Directory
2,000 Products

MEMBERSHIP OPTIONS AND BENEFITS

Individual Standard Membership:

- Six Issues Closing The Gap Solutions E-magazine
- 100+ Archived Webinars On-Demand
- 150+ Contact Hours
- The Acclaimed Resource Directory – A Guide to Over 2,000 AT Products

Individual Premium Membership:

- **Standard benefits plus....**
- Seat in ALL Upcoming Live Webinars
- CEUs Included. Each 90-minute live webinar includes 0.2 CEUs

INDIVIDUAL STANDARD MEMBERSHIPS		
1-YEAR STANDARD	2-YEAR STANDARD	PARENT MEMBERSHIP
$ 140 annually	$ 210 biennially	$ 85 annually

INDIVIDUAL PREMIUM MEMBERSHIPS		
1-YEAR STANDARD	2-YEAR STANDARD	PARENT MEMBERSHIP
$ 440 annually	$ 648 biennially	$ 274 anuually

GROUP MEMBERSHIP

Build District-Level Capacity

Support ALL educators with the training, tools and resources they need to successfully implement new and emerging technologies into existing programs, while simultaneously meeting education requirements.

NUMBER OF USERS	STANDARD MEMBERSHIPS	NUMBER OF USERS	PREMIUM MEMBERSHIPS
5-USER GROUP	$ 630 annually	5-USER GROUP	$ 2,100 annually
10-USER GROUP	$ 1190 annually	10-USER GROUP	$ 4,200 annually
25-USER GROUP	$ 2,800 annually	25-USER GROUP	$ 10,525 annually
35-USER GROUP	$ 3,850 annually	35-USER GROUP	$ 14,735 annually
50-USER GROUP	$ 5,250 annually	50-USER GROUP	$ 21,050 annually

SUPPLEMENTAL COLLEGE CURRICULUM – ELECTRONIC TEXTBOOK

Solutions, as an electronic textbook, is a very effective and cost efficient state-of-the-art training tool for undergraduate and graduate university students in the disciplines of special education and rehabilitation.

1-YEAR, STANDARD STUDENT MEMBERSHIP	1-YEAR, PREMIUM STUDENT MEMBERSHIP
$ 85 annually	$ 274 annually

LEARN MORE | JOIN TODAY | WWW.CLOSINGTHEGAP.COM