A Tale of Two Grant-Funded Special Education Recruitment and Training Projects Focused on Assistive Technology

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ABSTRACT
Colorado has a significant shortage of special education teachers, particularly within rural areas. This article will compare two grant-funded recruitment and training projects drawing connections from the current research base in training and retention. High-Leverage Practices were infused into these projects to support authentic assistive technology (AT) implementations and the use of multimodal literacy strategies with K-12 special education students. The recruitment and training grants focused on two distinct pathways for teacher preparation: alternative special education teachers and paraprofessionals. Consistent in both projects was the inclusion of intensive asynchronous online training related to AT and multimodal literacy and coursework assignments incorporating technology into their teaching and learning. The article will include project materials, timelines, training resources, illustrative case studies, and student artifacts showcasing exemplars and practical ways to apply these initiatives within teacher preparation programs.

KEYWORDS
High-leverage practices, online, special education recruitment, training.

Research acknowledges there is a tremendous benefit for K-12 students using assistive technology (AT) to enhance, accommodate, and access their learning (Dalton, 2014; Edyburn, 2010, 2015). Special educators need the knowledge and skills in AT to be able to assist their students. To develop this knowledge and skill, special educators must be active in their own learning, be able to identify the benefit of tools or strategies to implement them with their students, and be able to practice with or integrate technology within their learning to feel proficient using it with students (Oostveen, et al., 2008; Van Laarhoven, et al., 2012).

In 2020, the special education teacher shortage issues in Colorado were at an all-time high with 8.72% of special education positions unfilled or filled using an alternative method such as long-term substitutes in rural districts (CDE Teacher Shortage Dashboard, 2023). The lack of trained special education teachers in Colorado classrooms led to students' learning needs being unmet and compounded the stress of teaching teams trying to serve too many students (Billingsley & Bettini, 2019). The ripple effect of this teacher shortage is exacerbated due to increased workloads for teachers who are working on understaffed teams, especially for the students served in rural school districts. A way to reverse this negative cycle is providing current and relevant AT training and implementation across teacher preparation programs so that special education teachers are more effective in supporting their K-12 students (Cheek et.al, 2019). This effort will increase K-12 student independence and create more efficient workloads for teachers.

Confidence with Assistive Technology
AT instruction in teacher preparation programs is an important way to prepare

teachers for incorporating technology into their classroom. In a study by Jones et al. (2021), a dramatic increase in understanding, naming, and applying AT with preservice teachers was noted when given instruction with these services and supports. Creating a focus on AT knowledge, skills, and authentic tool use increases the awareness of and benefits for infusing technology across K-12 special education teacher preparation programs (Edyburn, 2015).

There should be few barriers for K-12 students to implement and use technology accommodations in the daily classroom experience with access to technology tools such as text-to- speech, speech-to-text, and digital annotation and the availability of these programs across different technology platforms free of charge. However, many educators are not proficient at utilizing these supports and/or may presume these supports would not be accessible to students served in special education. The Office of Educational Technology (2017) states

All teachers need to leave their teacher preparation programs with a solid understanding of how to use technology to support learning. Effective use of technology is not an optional add-on or a skill that we simply can expect teachers to pick up once they get into the classroom. Teachers need to know how to use technology to realize each state's learning standards from day one. (p. 35)

Izzo and Bauer (2013) indicate, "when accessible technology and instruction are provided using UDL principles…many students benefit with increased achievement. Learning through universally designed and accessible technology is essential for students with disabilities who, without access, would not gain the skills needed" (p. 17). These efforts positively impact student learning for all students, not just those with eligi-

ble disabilities served in special education programs. AT provides accommodations and specialized access to learning activities as a problem-solving measure when teams have identified roadblocks to learning. By doing this, AT can maximize student success with an equitable learning environment where all students are getting what they need to be successful. With the extreme need for special educators, states are getting creative in how they entice potential candidates to their program. Combining that call to action with the need for knowledge and skills in AT, our universities established projects that funded alternative special education teachers and grow-your-own paraprofessional pipelines.

PROJECT IMPLEMENTATION

In 2020-2022, our university implemented two grant projects to address the challenges related to a special education teacher shortage and decreasing retention rates. These projects were creative responses to the issues with a focus on AT. The activities were based on research that supports the use of AT in the classroom to help create efficient teacher instructional workflows to support K-12 student accommodations for over-burdened special educators (Billingsley & Bettini, 2019). AT technology toolkits were used as recruitment tools to entice prospective special education teacher candidates in both grant funded projects. The first project was framed by research focusing on teaching AT in teacher preparation programs so educators are efficient at using it in the classroom (Edyburn, 2015). The second project focused on AT and professional development for paraprofessionals completing a teacher preparation program while working in a K-12 special education setting. Similar to the first project, the second project included AT professional development training and a technology toolkit to participants. In the second

project, training and technology kits were also provided to mentors who were working with participating paraprofessionals in their K-12 special education setting.

Project Descriptions

The first project, the *Assistive Technology Cohort (AT)*, was a cohort of graduate students in a special education program who were alternatively licensed special education teachers. In Colorado, alternatively licensed special educators are required to be enrolled in a teacher preparation program, have earned a bachelor's degree, and are considered the teacher of record. Candidates in the *AT Cohort* (*n*= 9) were given a technology kit consisting of an iPad™, Apple Pencil™, and all program textbooks as etextbooks. The technology toolkit worked as an enrollment incentive along with intensive professional development around AT use and multimodal literacy best practices.

The second project, *Paraprofessional Pipeline,* focused specifically on paraprofessionals working towards obtaining their special education teacher licensure while concurrently working as a paraprofessional. The *Paraprofessional Pipeline* included paraprofessionals and their mentor who jointly participated in five synchronous intensive trainings related to special education topics. Each participant and mentor (*n*=10) received technology kits consisting of an iPad™ and Apple Pencil™ as well as access to the asynchronous online professional development course regarding AT and multimodal literacy best practices. Intensive mentor/paraprofessional trainings were provided on the following topics: (1) Co-teaching best practices; (2) Positive Behavior Intervention Systems (PBIS), Trauma-informed instruction, and classroom management; (3) IEP case management, and progress monitoring; (4) AT in special education programs; and

FIGURE 1: Assistive Technology (AT) Cohort & Paraprofessional Pipeline Timeline
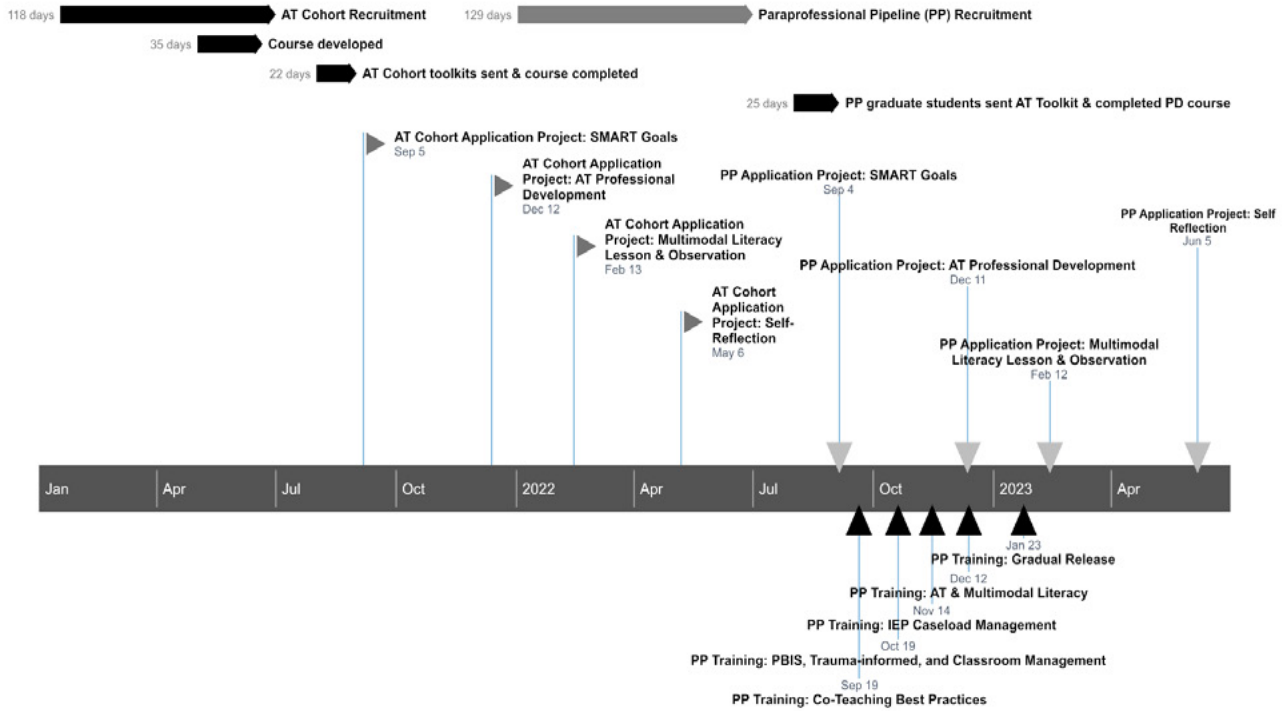
Note. This Timeline provides an overview of two grant-funded projects.

(5) Gradual release models.

The projects were funded by a statewide partnership with the department of education and collaboration with the *Collaboration for Effective Educator Development, Accountability, and Reform* (CEEDAR) Center. In addition to hands-on technology practice and implementation, the projects were designed to enhance special education teacher training with AT in the classroom.

Project Activities

A timeline of the activities for both projects are included in Figure 1. The *AT Cohort* integrated authentic practice projects within the yearlong residency and these projects are outlined on Table 1. The *Paraprofessional Pipeline* included five synchronous trainings with their mentors.

Recruitment

In the spring and summer of 2021, recruitment for the *AT Cohort* grant began with a focus on a cohort of alternatively licensed special education teachers. The *Paraprofessional Pipeline* began in the summer of 2022 including components of the *AT Cohort* grant. In addition, the *Paraprofessional Pipeline* also included training components unique to paraprofessionals and mentors. It focused on participants who were paraprofessional special education teacher candidates entering two separate teacher preparation graduate level programs for the 2022-2023 academic year. Both *AT Cohort* graduate students and *Paraprofessional Pipeline* graduate students were recruited using relational marketing efforts. Emails were sent to special education directors and K-12 principals in partnering school districts where previous graduate

program alumni were teaching and were designed to promote engagement from teachers, directors, and administrators. The *AT Cohort* and *Paraprofessional Pipeline* had similar implementation timelines beginning with applying for small, statewide grants in the fall semesters and notification of acceptance in early spring with most students being accepted and enrolled in programs by mid-July. In the summer preceding each project year, students were enrolled in the asynchronous AT professional development course and received technology kits to provide time to learn AT tools and try out multimodal literacy activities as a learner before the beginning of the school year.

Training Resources: AT & Multimodal Literacy

Within the professional development

TABLE 1: Assistive Technology (AT) & Multimodal Literacy Application Projects

Project Timeline	Early Fall	Fall	Winter	Spring	Late Spring
Assignment	SMART Goals: (1) Teacher as Learner and (2) K-12 Student Learning Goal, AT and/or Multimodal Literacy	AT Feature Match Project	AT Professional Development	Multimodal Literacy Lesson Plan and Video Observation	Final reflection on goal and AT projects
Resources/ Rubric	Template for creating SMART goals. Students were guided to create one goal related to their teaching and learning and one goal related to their K-12 students. They reflected on their progress towards these goals at the end of the year.	Assignment Criteria and Resources, Shared Canvas Commons entitled "AT Cohort"	Assignment Criteria and Rubric, Shared Canvas Commons entitled "AT Cohort"	Assignment Overview and Rubric, Shared Canvas Commons entitled "AT Cohort"	Pre- and Post-Survey Questions

Note: This table describes the application projects that were related to the AT and multimodal literacy learning students completed in the asynchronous AT professional development course.

TABLE 2: Assistive Technology (AT) & iOS for K-12 Student Accessibility and Multimodal Literacy Activities

	Learning and Literacy	Vision	Hearing	Physical and Motor Skills
Applications included in PD Course with Explicit Instruction	Speak Screen Dictation iBooks Google Drive Calendar Apple Apps Word Prediction	Voiceover Zoom Camera Within Camera: Screenshots	Closed Captions Accessibility alerts: Haptic, Flash, and Vibrating.	Guided Access Assistive Touch Siri
Application tasks	Multimodal Literacy Lesson Plan and Teaching Demonstration, Shared on Canvas Commons entitled "AT Cohort"	Professional Development & Feature Match Activity, Shared on Canvas Commons entitled "AT Cohort"	Professional Development & Feature Match Activity, Shared on Canvas Commons entitled "AT Cohort"	Professional Development & Feature Match Activity, Shared on Canvas Commons entitled "AT Cohort"

Note: This table provides an overview of the applications included within an online asynchronous professional development course and application tasks that were provided for students to apply them in their special education programs, See iOS Accessibility information here: https://www.apple.com/accessibility/

module, both cohorts learned about primary iOS accessibility categories related to AT and multimodal literacy: (1) learning and literacy, (2) vision, (3) hearing, and (4) physical and motor skills. Table 2 provides an overview of skills learned and application activities included with each.

As part of the professional development course offering, training regarding specific iOS applications native to the iPad were emphasized, noting the benefit of using applications and iOS accessibility features that can increase ease of use for K-12 students. Within the professional development course, *AT Cohort* and *Paraprofessional Pipeline* participants practiced multimodal literacy and teacher instructional workflow activities using iOS apps such as: Keynote, Pages, Numbers, Camera, and Safari. Other commonly used applications in K-12 settings were recommended for download, including Clips and Google Drive for iOS, if working in a School District using Google Applications.

Multimodal literacy is defined as texts that are multimodal, in which meaning is communicated through combinations of two or more modes that are multi-media. Modes include written language, spoken language, video, audio files, and patterns of meaning: visual, audio, gestural, tactile, and spatial (Dalton, 2014). Multimodal texts provided in these multiple modes create literacy activities that enhance, differentiate, and remediate student learning. Multimodal learning can provide even greater accessibility for K-12 students when combining the accessibility features native to iOS™ devices (Apple Devices), such as text-to-speech and annotation capabilities, for use while completing multimodal literacy activities (Coyne, et al., 2012). These accessibility features accommodate learner variability (Edyburn, 2015) while not calling negative attention to students who need accommodations.

When accessibility is effortlessly combined with learning activities students are seen as strategic learners able to use tools to support their learning (Dalton, 2014).

The AT and multimodal literacy asynchronous professional development module is estimated to take 5-10 hours to complete from start to finish. It included a pre- and post- survey, overview of AT and UDL, information related to AT supports on iOS devices, multimodal literacy learning activities, and several hands-on application activities for course participants. During the year, once students began their residencies, several AT and multimodal literacy projects were integrated into the residencies (e.g., student teaching) for participants to implement using the technology toolkits and information learned in the asynchronous AT and multimodal literacy course.

Implementation

Utilizing the new devices, the participants in both projects were trained in best practices of AT with the explicit purpose of promoting high leverage practices (HLP) and evidence-based multimodal literacy instruction practices in the classroom. Members were both learners in using the AT supports and applications on the iPad, along with developing skills to teach the new AT knowledge and skills to K-12 students being served in special education. These multimodal literacy practices guided cohort members to use AT tools for access and literacy learning enhancement with their eTextbooks utilizing supports such as text-to-speech, highlighting tools, mark-up tools, and multimedia literacy resources that could support their own reading comprehension. Additionally, the professional development module instructed on best practices in designing for diversity and learner variability using Universal Design for Learning (UDL) to *proactively* enhance K-12 student
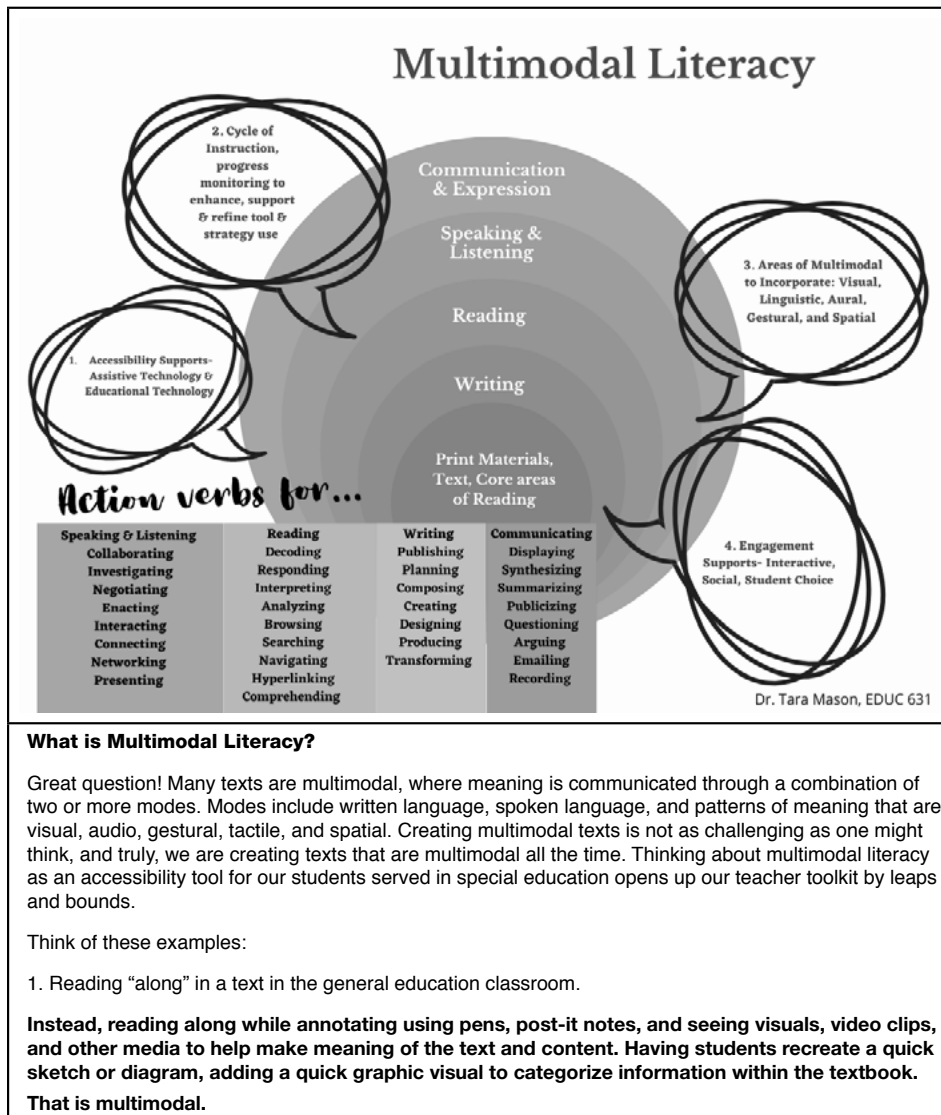
learning while simultaneously accommodating in a *reactive way* for accessibility using AT applications and supports on the iPad. The professional development module included for both projects was integrated into coursework projects and was designed to provide authentic, hands-on practice using technology as both a learner and as a teacher with K-12 students on their caseload. The *AT Cohort* also received etextbooks for the enrolled coursework. The AT project was implemented during the 2021/2022 school year and the Paraprofessional Pipeline implemented the following year.

Within the intensive trainings provided to the *Paraprofessional Pipeline* cohort, evidence-based practices were highlighted in topics such as co-teaching, individualized education plans (IEP)/ case management, behavioral supports, literacy within the context of the science of reading, and classroom AT use. These learning partnerships served to remove the barriers to becoming a special education teacher. Research has noted that paraprofessionals have a perceived lack of skills, report an insufficient amount of training, and limited supervision and these factors are found to often prevent paraprofessionals from pursuing teaching licensure (Abbate-Vaughn et al., 2009; Mason et al., 2020). By focusing on the skills and knowledge that special educators implement to bring about positive outcomes for students, the project aimed to create a sense of self-efficacy in paraprofessionals so that they would view the field of teaching as a positive, obtainable professional goal.

Project Application Projects

An additional component of the AT training in these two projects was authentic implementation of AT learning and teaching within the preparation program coursework. Students in both projects created Specific, Measurable,

FIGURE 2: Exemplar Artifact from Course Learning Module Excerpt: Multimodal Literacy

What is Multimodal Literacy?

Great question! Many texts are multimodal, where meaning is communicated through a combination of two or more modes. Modes include written language, spoken language, and patterns of meaning that are visual, audio, gestural, tactile, and spatial. Creating multimodal texts is not as challenging as one might think, and truly, we are creating texts that are multimodal all the time. Thinking about multimodal literacy as an accessibility tool for our students served in special education opens up our teacher toolkit by leaps and bounds.

Think of these examples:

1. Reading "along" in a text in the general education classroom.

Instead, reading along while annotating using pens, post-it notes, and seeing visuals, video clips, and other media to help make meaning of the text and content. Having students recreate a quick sketch or diagram, adding a quick graphic visual to categorize information within the textbook. That is multimodal.

Achievable, Realistic, and Time-Bound (SMART) goals to guide their use of AT Toolkit devices over the year in their K-12 programs both as a learner and teacher. The four implementation projects included in this project were (1) SMART goals, (2) multimodal literacy lesson, (3) AT professional development (PD), and (4) pre- and post- AT reflection. The SMART goals created by participants typically focused on implementation of AT supports and teaching students' strategies for using AT to support their learning. In the

multimodal literacy lesson participants created a multimodal literacy lesson plan, filmed themselves teaching the lesson and self-reflected on the lesson, and shared their video lesson snippets and reflections with peer colleagues in their courses. The multimodal literacy unit within the PD course included multiple application-based activities for participants to try out using AT features on the iOS device that would support their student's literacy learning needs (See Figure 2, Exemplar Artifact). The AT professional development provided

an opportunity for participants to teach hypothetical colleagues about an AT topic of interest. Finally, participants reflected before the AT PD and after completing the PD course. See Table 1 for further explanation of these application projects.

Coursework Exemplars, See Figure 2, Exemplar Artifact

PARTICIPANT STORIES

Being familiar with AT, participants experienced enhanced classroom experiences for students and increased self-confidence. Participants also found that AT, when used consistently and appropriately, streamlined educational interventions and decreased the workload for them.

AJ: AT Cohort, Alternative Special Education Teacher, previous Paraprofessional

AJ is between 40-50 years of age and works at an elementary school. AJ had been in the field of special education for over a decade working as a paraprofessional. While completing the special education teacher license, AJ worked as an alternatively-licensed special education teacher in a rural elementary school with a caseload of 10-15 students with mild to moderate learning needs in categories such as Specific Learning Disabilities (SLD) in reading or math, Autism, and Attention Deficit Disorder (ADHD; IDEA, 2004). She self-identified as an intermediate technology user and believed that technology was "important" to "extremely important" and considered technology to be helpful and to benefit student learning. She consistently highlighted technology tools in all lesson observations throughout the year, including using text-to-speech to read aloud with students during small groups. AJ's growth goals included using technology in teaching and she noted that her school is currently working towards

more universal access and funding technology literacy supports for students such as text-to-speech and technology tools to markup text.

MB: AT Cohort, Added Endorsement Alternative Special Education Teacher

MB was a graduate student in her early thirties working in a rural school district at the elementary level as an alternatively licensed special education teacher. She worked as a general education teacher for several years before applying to the program to obtain an added endorsement in special education. MB started as an intermediate technology user and became an advanced user after finishing the project. Additionally, she felt that she was "augmenting with technology" on SAMR and rated herself as modifying with technology after completing the project. The SAMR model stands for Substitution, Augmentation, Modification, and Redefinition using technology tools (Romrell et al., 2014). Participants learned about these different technology implementation levels and rated themselves on their level of implementation before the school year launched and at the end of the school year in May. MB felt that she had been replacing with some functional improvements for students in the beginning of the study and at the culmination of the study she felt that she was implementing technology with significant task redesign (i.e., modification on SAMR).

MB noted on the post-project survey that learning and using accessibility features on the iPad helped in her teaching students to then generalize accessibility features to their chromebooks. She talked about how much students enjoyed using speech-to-text and text-to-speech. As a result of the *AT Cohort* training, MB created multimodal interactive notebooks with a small group of 5th graders. Near the end of the year, she had a new student join her caseload. This student

FIGURE 3: Exemplar Artifact, Proposed Gradual Release Model for Mentor and Paraprofessional

Note: This figure presents two triangles side by side that show a gradual progression of mentor leadership responsibilities and paraprofessional student teaching responsibilities and their shift over time to less leading by the mentor.

was added to 5th grade due to age but had never attended school before that year. To help the student access general education, MB taught the student to use text-to-speech on websites enabling the student to participate in many classroom literacy activities.

PT: Paraprofessional Pipeline, Paraprofessional

PT was with the *Paraprofessional Pipeline* project, a graduate student in her early thirties working in a rural school district at the elementary level as a paraprofessional. She had worked as a paraprofessional for several years before applying to a program to obtain a special education teaching license. PT wanted to participate in the project citing the "need to become proficient with assistive technology before transitioning to being a special educator."

PT's mentor was interested in learning more about AT, specifically strategies to support students with autism. The mentor had been a special educator for 30 years in middle and elementary schools in mostly rural communities. PT and her mentor had worked together for nine years and had a good understanding of each other's work expectations. PT was encouraged by her mentor to take the next step and obtain her special education licensure.

Both the mentor and PT found the trainings to provide useful information for special educators. They both reported receiving useful information about gradual release and looked forward to implementing ideas presented through the trainings. The mentor appreciated the AT module and the ability to use the information quickly in the classroom to support K-12 students. PT reported the AT module was extremely useful and would guide her master's Capstone

paper. Both the mentor and PT found the process to be helpful ways to launch into mentoring conversations about the special education field. Similar to the previous *AT Cohort* examples, PT and her mentor reported authentic implementation and enhanced technology use as a result of learning about AT tools and multimodal literacy strategies learned.

CONCLUSION

The need for special education teachers is not an issue that will be solved easily so efforts must include creative problem solving in the recruitment and retention. Teacher shortages can have a complicated impact in small rural districts where filling vacancies can be a challenge with factors such as remote location, lack of resources, and high caseloads being frequently stated as reasons that exacerbate the needs for these rural school districts (Hollo et al., 2019; Sawchuk, 2018; Viadero, 2018). When looking at recruitment and retention of special educators, factors such as workload and working conditions must be considered. In a comprehensive review of the literature, conducted by Billingsley and Bettini (2019), the most substantial factor for attrition was working conditions. Teachers stated they needed more time to work with students, and the demands of the job are often factors in why special educators leave current positions and the teaching profession entirely. If districts can find ways to support special educators by creating efficient workloads, more special educators may be willing to stay. In a synthesis of research regarding special education teacher perceptions and burnout in the field from 1979 through 2013, Brunsting et al. (2014) note, "While teacher supply is still an important responsibility, they argue the focal question is no longer how do we recruit more teachers but rather how can we best train and support our teachers?"

(p. 682). They explain that teacher burnout is more complex than just special education teachers feeling unsatisfied in their roles resulting in them leaving the field. It is a multidimensional issue of special education teachers feeling that they are overloaded, cannot be successful, feeling exhausted and overwhelmed, and in extreme cases, even reporting physical illness, and depression due to their excessive workload.

Along with creating efficient workloads, finding ways to recruit candidates has long been a challenge in the education field. With the number of people entering the teaching field on the decline, it has proven to be a challenge for education in general, more so for the field of special education. One factor that has been successful in retaining prospective special education professionals is prior experience working with people with disabilities (Hobson, 2022; Mamlin & Diliberto, 2020, Reeves et al., 2021; Scott & Alexander, 2019). Recruiting from within the school system, such as paraprofessionals or general education teachers adding their endorsement in special education, are key to the recruitment of prospective special educators who may feel more capable in their new role. Additionally, relational recruitment efforts such as reaching out to groups who are likely to be interested in a career as a special educator are effective methods for encouraging people to pursue a special education license (Hobson, 2022; Mamlin & Diliberto, 2020).

Recruitment strategies that IHE's employ are varied and wide. Some states have used strategies such as gaining a special education endorsement by completing the accompanying exam (Hollo et al., 2019) while other states offer alternative pathways where new teachers are enrolled in a preparation program while working as a teacher. The two projects described here aimed to work with districts and schools to

provide resources to support and encourage retention of special educators. These projects included innovative use of online professional development and synchronous training of mentors that added value to their impact. The participants were well-equipped to go into the classroom using AT; they were more confident and able to encourage independence through technology for K-12 students with disabilities.

Next Steps

These two projects, with recruitment incentives and training grants, prepared participants to teach in special education programs with an enhanced understanding of AT and ideals to help with workload efficiency. These projects also provided a community of practice with shared language, authentic practice, and coursework integration that resulted in increased teacher confidence in the classroom. These small changes and accommodations for potential candidates can make a significant impact for recruiting and retaining special education teachers.

Schools and IHE's must be more flexible, understanding, and supportive moving forward if any progress is to be made on addressing the special education teacher shortage. By focusing on the needs specific to teacher preparation pathways (i.e., paraprofessional pipelines) and alternative special educators, and also integrating authentic use and implementation of AT to help with increased K-12 student independence, recruiting and retaining special educators to fill high need vacancies may become less challenging. Moving forward, IHEs must continue to explore innovative ideas that include collaboration and intentional technology-enhanced learning for potential candidates with K-12 students at the center of the work. This kind of innovation can open many doors for students and special educators alike.

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REFERENCES

Abbate-Vaughn, J., Paugh, P. C., & Douglass, A. (2011). Sound bites won't prepare the next generation: Early childhood teacher education policy public-private divide in Massachusetts. *Educational Policy*, *25*(1), 215-239. https://doi.org/10.1177/0895904810386602

Billingsley, B., & Bettini, E. (2019). Special education teacher attrition and retention: A review of the literature. *Review of Educational Research*, *89*(1), 697–744. https://doi.org/10.3102/0034654319862495

Brunsting, N. C., Sreckovic, M. A., & Lane, K. L. (2014). Special education teacher burnout: A synthesis of research from 1979 to 2013. *Education and treatment of children*, 681-711. https://doi.org/10.1353/etc.2014.0032

Cheek, A. E., Idol, W. A., Jones, J. L., & Holden, K. B. (2019). Infusing technology throughout teacher preparation programs to support preservice teacher development. *The Journal of Special Education Apprenticeship*, *8*(2), 8.

Colorado Department of Education. (n.d.). *CO Educator preparation program report dashboard*. CDE. https://www.cde.state.co.us/code/eppreport

Coyne, P., Pisha B., Dalton, B., Zeph, L., & Cook Smith, N. (2012). Literacy by design: A universal design for learning approach for students with significant intellectual disabilities. *Remedial and Special Education, 33* (3), 162-172. http://dx.doi.org/10.1177/0741932510381651

Dalton, B. (2014). E-text and e-books are changing literacy landscape. *Phi Delta Kappan*, *96*(3), 38-43. https://doi.org/10.1177/0031721714557451

Edyburn, D. L. (2010). Would you recognize universal design for learning if you saw it? Ten propositions for new directions for the second decade of UDL. *Learning Disability Quarterly*, *33*(1), 33-41. https://doi.org/10.1177/07319487100330010

Edyburn, D.L. (2015), "Expanding the Use of Assistive Technology While Mindful of the Need to Understand Efficacy," Efficacy of Assistive Technology Interventions. *Advances in Special Education Technology*. Vol. 1, 1-12. https://doi.org/10.1108/S2056-769320150000001001

Hobson, J. (2022, August 25). *A systematic review of factors associated with special education teacher recruitment*. Qeios. https://www.qeios.com/read/0YCZO3

Hollo, A., Floyd, K. K., & Brigandi, C. B. (2019). Endorsement by exam: Policy and practice in rural special education. *Rural Special Education Quarterly*, *38*(3), 177–184. https://doi.org/10.1177/8756870519843500

Individuals with Disabilities Education Act, 20 U.S.C. § 1400 (2004) https://sites.ed.gov/idea/

Izzo, M. V., & Bauer, W. M. (2013). Universal design for learning: Enhancing achievement and employment of STEM students with disabilities. *Universal Access in the Information Society, 14*(1), 17-27. https://doi.org/10.1007/s10209-013-0332-1

Jones, B. A., Peterson-Ahmad, M., Fields, M., & Williams, N. (2021). Training Preservice Teachers to Match Assistive Technology to Student Needs. Journal of Special Education Technology, 36(4), 271–283. https://doi.org/10.1177/0162643420918337

Mamlin, N., & Diliberto, J. A. (2020). There's no place like home: Finding teachers in your backyard. *Rural Special Education Quarterly*, *39*(2), 104–112. https://doi.org/10.1177/8756870520912465

Mason, R. A., Wills, H. P., Irvin, D., Jia, F., & Kamps, D. M. (2020). Ecobehavioral assessment of paraeducator behaviors that support engagement of students with disabilities. *Exceptional Children*, *86*(4), 413-429. https://doi.org/10.1177/0014402919893693

Oostveen, R. V., Muirhead, W., & Goodman, W. M. (2011). Tablet PCs and reconceptualizing learning with technology: A case study in higher education. *Interactive Technology and Smart Education, 8*(2), 78–93. https://doi.org/10.1108/17415651111141803

Reeves, L. M., Parrish, C. W., & Guffey, S. K. (2021). Choosing a career in special education. *Journal of Research in Special Educational Needs*, *21*(2), 73–85. https://doi.org/10.1111/1471-3802.12500

Romrell, D., Kidder, L., & Wood, E. (2014). The SAMR model as a framework for evaluating mLearning. *Online Learning Journal*, *18*(2). https://doi.org/10.24059/olj.v18i2.435

Sawchuk, S. (2023, January 30). *Staffing schools in no-stoplight towns*. Education Week. https://www.edweek.org/leadership/staffing-schools-in-no-stoplight-towns/2018/01

Scott, L. A., & Alexander, Q. (2019). Strategies for Recruiting and Retaining Black Male Special Education Teachers. Remedial and Special Education, 40(4), 236–247. https://doi.org/10.1177/0741932517732636

U.S. Department of Education, Office of Educational Technology, (2017). Reimagining the Role of Technology in Education: 2017 National Education Technology Plan Update, Washington, D.C.

Van Laarhoven, T., Munk, D. D., Chandler, L. K., Zurita, L., & Lynch, K. (2012). Integrating Assistive Technology into Teacher Education Programs: Trials, Tribulations, and Lessons Learned. *Assistive Technology Outcomes and Benefits*, *8*(1), 32-47.

Viadero, D. (2023, January 30). *Teacher recruitment and retention: It's complicated*. EducationWeek. https://www.edweek.org/leadership/teacher-recruitment-and-retention-its-complicated/2018/01