EFFICACY OF TEACHERS TRAINING PARAPROFESSIONALS TO IMPLEMENT PEER SUPPORT ARRANGEMENTS

By

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

Legislative mandates, current best practice, and advocacy efforts assert that students with severe disabilities (i.e., students with intellectual disability and/or autism who are eligible for alternate assessment) should be included in general education classrooms with same-aged peers without disabilities. The Individuals with Disabilities Education Improvement Act (2004) and the No Child Left Behind Act (2001) require all students—including students with severe disabilities—to access the general education curriculum. Many researchers argue students with severe disabilities cannot access important parts of the general education curriculum without learning alongside peers without disabilities in the same classrooms (Halle & Dymond, 2008/2009; Jackson, Ryndak, & Wehmeyer, 2008/2009). Indeed, research shows inclusive education can enable students with severe disabilities to learn academic content (e.g., Coyne, Pisha, Dalton, Zeph, & Smith, 2012), build social competence and develop friendships with peers (e.g., Carter, Moss, Hoffman, Chung, & Sisco, 2011; Fisher & Meyer, 2002), and improve adaptive behavior and functional skills (e.g., McDonnell et al., 2003). Advocacy groups have long argued inclusive education is an issue of equality and justice, and students with severe disabilities deserve to learn alongside peers without disabilities in general education classrooms (TASH, 2009).

Inclusion may be especially critical for middle and high school students with severe disabilities. For students preparing to transition to adulthood and begin careers, building strong interpersonal skills and social competence is critical (Carter, Trainor, Ditchman, Swedeen, &

Owens, 2011), and these skills may best be learned by interacting with peers without disabilities in general education settings (Logan & Malone, 1998). In addition, social relationships take on increased importance and prominence in adolescence (Wentzel, Barry, & Caldwell, 2004). All adolescents, including those with disabilities, desire interactions and acceptance from peer groups. Developing these peer relationships is associated with improved global outcomes, including overall quality of life (Rubin, Bukowski, & Laursen, 2009). Without participation in general education classrooms, middle and high school students with severe disabilities have few opportunities to interact with their peers without disabilities.

Direct Support from Paraprofessionals

In recent years, schools have increasingly turned to paraprofessionals to support students with disabilities in inclusive settings. The number of special education paraprofessionals has nearly tripled in the past 25 years (Pickett, 1986; U.S. Department of Education, 2012). Since 2010, special education paraprofessionals have outnumbered special education teachers in the United States (401,285 paraprofessionals employed FTE to 370,456 teachers employed FTE; U.S. Department of Education, 2012). In a statewide survey, more than 80% of paraprofessionals reported spending some or most of their time supporting students with disabilities in inclusive environments (Carter, O'Rourke, Sisco, & Pelsue, 2009).

A substantial proportion of paraprofessionals is assigned to provide direct support to individual students with severe disabilities in general education classrooms (Giangreco & Broer, 2007; Suter & Giangreco, 2009). In a direct support model, paraprofessionals assume almost exclusive responsibility for meeting the needs of one or more students with a disability in a particular classroom. These paraprofessionals spend much of their time delivering instruction, providing behavioral support, and supervising the students to whom they are assigned

(Giangreco & Broer, 2005). Although these roles actually extend far beyond recommended responsibilities for paraprofessionals, in this support model students functionally receive the majority of their instruction from paraprofessionals (Giangreco, Edelman, Broer, & Doyle, 2001).

Paraprofessionals typically do not receive adequate training to be the primary instructional agent for students with severe disabilities. In fact, most paraprofessionals have received very little or no formal training related to educating students with extensive support needs (Carter et al., 2009; Riggs & Mueller, 2001). Many paraprofessionals have no education past high school (Fisher & Pleasants, 2012) and most have never received in-service training on basic instructional strategies (Carter et al.). Moreover, paraprofessionals indicate they need further training in strategies to support students with disabilities in general education settings (Riggs & Mueller) and that their current level of training is inadequate (Breton, 2010).

Due to this lack of training, direct paraprofessional support can have unintended negative consequences. First, direct paraprofessional support may foster unnecessary dependence on adults. Because their sole responsibility is to provide support to individual students, paraprofessionals sometimes provide more guidance and direction then students actually require, fostering dependence and learned helplessness (Giangreco, 2010). For example, parents have raised concerns that direct paraprofessional support decreases their children's opportunities to make their own choices and exercise independence (Giangreco, Yuan, McKenzie, Cameron, & Fialka, 2005). Similarly, some paraprofessionals have noted the students with disabilities whom they support are overly dependent on them (Giangreco & Broer, 2005). Despite these concerns, plans to fade direct paraprofessional support over time rarely exist (Giangreco, 2010).

Second, direct paraprofessional support can hinder social outcomes. For example,

paraprofessionals providing direct support sometimes sit with students in the back of the classroom away from peers without disabilities, decreasing opportunities for interaction (Giangreco & Broer, 2005). In addition, paraprofessionals providing direct support often remain in close physical proximity to students with severe disabilities, and this close proximity is associated with decreased interactions between adolescents with disabilities and their peers. In a descriptive study involving middle and high school students with developmental disabilities, students had the fewest interactions with peers when in close proximity to a paraprofessional providing direct support (Carter Sisco, Brown, Brickham, & Al-Khabbaz, 2008). The presence of an adult disrupted natural interactions between students with and without disabilities. In another study, Giangreco, Broer, and Edelman (2001) found direct paraprofessional support promoted insular relationships between paraprofessionals and elementary, middle, and high school students with developmental disabilities. Students interacted almost exclusively with a paraprofessional, and were socially isolated and stigmatized. Giangreco and Broer found many paraprofessionals reported that students with severe disabilities thought of them or other paraprofessionals as their primary "friends" at school. Indeed, without adequate training, direct paraprofessional support can decrease opportunities for students with severe disabilities to build independence and social competence—two of the primary aims of inclusion for this population (Cushing, Carter, Clark, Wallis, & Kennedy, 2009).

Peer Support Arrangements as an Alternative to Direct Paraprofessional Support

Emerging research shows when given adequate training and support, paraprofessionals can facilitate peer support arrangements that promote opportunities for interaction with peers and independence from adults (Carter et al., 2011; Carter, Sisco, Chung, & Stanton-Chapman, 2010). Peer support arrangements involve one or more peers without disabilities providing ongoing

social and academic support to classmates with disabilities in a general education classroom. First, an adult facilitator (i.e., a paraprofessional) invites one or more peers to provide support to a student with a severe disability. The facilitator meets with peers to orient them to their new roles and identify specific ways they might support the student with a disability. Peers might provide support in a variety of ways, depending on the characteristic of the student with a disability. Roles may include, but are not limited to, helping the student prepare for class activities, providing frequent feedback and encouragement, modeling appropriate communication and social skills, promoting interaction with other classmates, identifying a role in a small-group activity that matches the student's strengths, or supporting behavior intervention plans as appropriate. Instead of providing only direct support to students with disabilities, paraprofessionals shift to a facilitative role by coaching, supervising, and providing feedback to peers who provide support. As peers take on support roles, adult proximity and support are faded, enabling students with severe disabilities to benefit from natural supports from peers and avoid overreliance on adult support (Carter et al.).

Four single-case design studies show paraprofessionals can assist in implementing peer support arrangements in ways that improve outcomes for middle and high school students with disabilities, including increased interaction with peers and consistent or increased levels of engagement. In two studies using a reversal design, Shukla, Kennedy, and Cushing (1998, 1999) investigated the effects of peer support arrangements for a total of five middle school students with moderate or severe intellectual disability. Compared to paraprofessional direct support, both studies showed peer support arrangements resulted in more frequent and longer interactions with peers, and similar or modestly higher levels of engagement in class activities. In two studies using a multiple-baseline-across-participants design, Carter and colleagues (Carter et al., 2011;

Carter, Sisco, Melekoglu, & Kurkowski, 2007) studied the effects of peer support arrangements for a total of seven high school students with moderate or severe intellectual disability. In both studies, peer support resulted in more frequent social interactions with peers compared to adult direct support. There were no clear differences in academic engagement between conditions.

Furthermore, peer support arrangements may also benefit the peers who provide support. In two studies, researchers intentionally selected peers with a history of low academic engagement (Cushing & Kennedy, 1997) or low academic performance (Shukla et al., 1998). In both cases, peers participated more in class (i.e., engaged in class activities longer) when providing support to their classmates with severe disabilities. Cushing and Kennedy also found that peers demonstrated improved academic performance when providing peer support. In addition to potential academic benefits, providing support gives peers the opportunity to develop a relationship with a student with a severe disability they might not otherwise have had. In the only study to interview peers providing support, peers described several potential benefits of providing peer support, including a better understanding of students with disabilities and developing new friendships (Carter et al., 2011).

Although peer support arrangements are associated with improved outcomes for both the students who receive and provide support, it is not clear from these studies if paraprofessionals can facilitate these arrangements in everyday settings without ongoing support from a member of a research team. In two of the aforementioned studies (Carter et al., 2007; Carter et al., 2011), a member of the research team provided ongoing support and implemented key parts of the intervention, including identifying ways peers might provide support and orienting peers to their new roles. In the other two studies (Shukla et al., 1998, 1999), paraprofessionals were primarily responsible for training and supervising peers with ongoing support by a member of the research

team. Given the heavy researcher involvement in these studies, it is unclear if peer support arrangements would produce similar results under more typical circumstances without outside involvement.

Preparing Paraprofessionals to Facilitate Peer Support Arrangements

At present, it is unclear how paraprofessionals should be trained to facilitate peer support arrangements, or who should provide this training. Models for how to train paraprofessionals to facilitate peer support arrangements have not been described in the research literature. In fact, there are very few studies about preparing paraprofessionals to implement *any* intervention for students with severe disabilities. In a recent systematic review, Brock and Carter (in press) found only 13 experimental studies that involved training paraprofessionals to implement any type of intervention for students with intellectual or developmental disabilities. Nearly all studies in this review involved one-to-one coaching or mentoring where a professional development coach delivered individualized follow-up training to the paraprofessional. Within this context of one-to-one coaching, three components were included in intervention packages associated with paraprofessional acquisition of correct implementation behaviors: modeling, performance feedback, and accountability. Modeling involved live (e.g., Gilligan, Luiselli, & Pace, 2007) or video modeling (e.g., Robinson, 2011) of the targeted intervention as the coach highlighted key steps of the intervention. Performance feedback involved a coach observing the paraprofessional implementing the intervention and providing constructive verbal, visual, or video feedback on his or her performance (e.g., Bingham, Spooner, & Browder, 2007; Hall, Grundon, Pope, & Romero, 2010; McDonnell, Johnson, Polychronis, & Riesen, 2002). Both modeling and performance feedback are associated with improved implementation in the broader coaching literature, including studies involving follow-up training for special educators (Kretlow &

Bartholomew, 2010) and early childhood practitioners (Snyder et al., 2012). In addition to modeling and performance feedback, these studies all incorporated some degree of accountability. For example, researchers explicitly instructed paraprofessionals to implement the targeted interventions in daily practice and followed up to ensure implementation actually occurred.

Together, these components represent three critical training features. Trainers should clearly communicate how to implement an intervention (modeling), ensure participants attempt to implement the intervention in everyday practice (accountability), and then follow up with participants to reinforce what they are doing well and to help them correct their mistakes (performance feedback). In a recent pilot study (Brock & Carter, 2013), we combined modeling, performance feedback, and accountability into a flexible and replicable training package called Video Modeling Plus Abbreviated Coaching (VMPAC). This training package involves an initial training workshop followed by video modeling and brief on-site performance feedback. The initial training workshop includes a description and demonstration of the instructional practice, as well as opportunities for practitioners to simulate the instructional practice through role play. Video modeling involves having practitioners compare their own performance to video exemplars reflecting a range of students. While watching a video exemplar of an instructional practice, practitioners review the steps associated with the practice and plan how they might implement it with a student in their classroom. The performance feedback session involves a single 1-hr meeting in which a coach—someone with expertise in the targeted strategy—observes the practitioner implementing the instructional strategy in the natural school setting, provides targeted instructive feedback, models the correct implementation steps, and gives the practitioner additional opportunities for guided practice. During the performance feedback

session, the coach holds the paraprofessional accountable for planning and attempting to implement the instructional strategy ensuring paraprofessionals have completed written plans.

The VMPAC training package is designed to capitalize on effective components of training while considering the logistical and resource constraints of public school districts providing professional development. Most individualized coaching models require extensive one-to-one consultation over the course of weeks or months (e.g., Fixsen, Naoom, Blase, Friedman, & Wallace 2005; Kretlow & Bartholmew, 2010). School systems looking for efficient ways to train large numbers of paraprofessionals are unlikely to invest in approaches that require considerable time and resources while only impacting a single practitioner at a time (Russo, 2004). In contrast, VMPAC only requires one hour of one-to-one consultation and utilizes technology to provide low-cost supplemental training through video modeling.

Results from a pilot study of the training package were promising. In a small randomized-controlled trial, Brock and Carter (2013) taught 25 paraprofessionals to implement constant time delay, a simple behavioral intervention for systematically fading prompts. Paraprofessionals who received the VMPAC training package were able to accurately implement constant time delay to teach a variety of new skills to students with disabilities at their schools. Compared to paraprofessionals receiving only a standalone training workshop, paraprofessionals receiving VMPAC implemented constant time delay with far superior fidelity (d = 2.67).

One limitation of this pilot study was that the training was provided by members of a research team, rather than school-based staff. In typical schools, the individuals best positioned to provide widespread sustainable training to paraprofessionals might be the special education teachers who supervise them. Special education teachers are already charged with directing how paraprofessionals provide support and instruction to students with disabilities (IDEA, 2004).

Certified special education teachers should have the expertise in instructional and support strategies for students with disabilities required to provide training to paraprofessionals. In addition, these teachers already have established working relationships with the paraprofessionals they supervise. Although special education teachers are prime candidates for providing training to paraprofessionals, it is unclear from existing research if special educators are able to train paraprofessionals to accurately implement interventions with students with severe disabilities (Brock & Carter, in press).

Research Questions

If special education teachers could use VMPAC to teach paraprofessionals to accurately implement promising education practices like peer support arrangements, this could provide a vehicle to improve the quality of instruction and support provided to students with severe disabilities. At present, it is unclear (a) if teachers can deliver training to paraprofessionals that enables them to accurately implement recommended educational practices for students with severe disabilities, (b) how teachers should train paraprofessionals to facilitate peer support arrangements with fidelity, and (c) if peer support arrangements implemented by paraprofessionals (without substantial involvement from a research team) result in improved outcomes for students with severe disabilities. The present study addresses the following research questions:

1. Does a teacher-delivered professional development package consisting of an initial training session, video modeling, and a performance feedback session, improve paraprofessional implementation fidelity of peer support arrangements?
2. Do peer support arrangements facilitated by paraprofessionals result in improved social and academic outcomes for students with severe disabilities?

3. How do the special education teachers and paraprofessionals perceive the feasibility and acceptability of the professional development package?

CHAPTER II

METHOD

Students with Disabilities, Paraprofessionals, and Special Education Teachers

Four triads of students with severe disabilities, paraprofessionals who provided one-to-one support, and supervising special education teachers participated in this study. To be included in this study, students had to (a) be enrolled in middle school, (b) be receiving special education services under the category of intellectual disability or autism, (c) be eligible for alternate assessment, (d) be enrolled in at least one general education class, (e) provide assent and parental consent, (f) receive ongoing support from a paraprofessional who consented to participate in the study and (g) be on the caseload of a special education teacher who consented to participate in the study. After reviewing the study overview with the researcher, special education teachers selected students whom they believed might benefit from a peer support arrangement and met inclusion criteria.

Destiny and Darrell. Destiny was a 12-year-old European American female with intellectual disability and attention deficit disorder in the sixth grade. She used verbal speech to communicate. Destiny's teacher indicated Destiny enjoyed interacting with her peers but had few opportunities to do so. Destiny was enrolled in four general education classes, including related arts (e.g., art, physical education, music), study hall, science, and social studies. She also received speech services. Her Individual Education Program (IEP) reported the following assessment scores: Wechsler Intelligence Scale for Children, Fourth Edition (Wechsler, 2003; standard score of 54, percentile of .1); and Adaptive Behavior Assessment System, Second

Edition (Harrison & Oakland, 2003; standard score of 65, percentile of .1). Destiny's IEP included goals targeting improved use of language and communication, working independently on class activities, basic math skills (e.g., counting money, solving simple word problems), and reading comprehension.

Darrell, a special education paraprofessional, supported Destiny in science class. Darrell was an African American male with 14 years of experience in special education, including 7 years of experience in his current role. At the time of the study, Darrell had not yet earned a college degree but was pursuing teacher certification in special education. Darrell also supported other students with mild, moderate, or severe disabilities in general education classrooms. In addition, Darrell supervised several students with disabilities—including Destiny—as they worked on vocational skills in the school office, school store, or cafeteria. Darrell was supervised by a European American female special education teacher who had a master's degree, 29 years of experience in special education, and 13 years of experience in her current role.

Thomas and Renee. Thomas was a 14-year-old European American male with intellectual disability, speech impairment, and hearing impairment in the eighth grade. He used verbal speech to communicate. Based on notes from baseline observations, Thomas enjoyed interacting with peers, but his conversations with peers were often repetitive and centered on his restricted interests. Thomas was enrolled in three general education classes including science, social studies, and related arts (e.g., art, physical education, music). Thomas received occupational therapy and hearing/audiology services. His IEP reported the following assessment scores: Stanford–Binet Intelligence Scales, Fifth Edition (Roid, 2004; standard score of 40, percentile of .1); and the Adaptive Behavior Assessment System, Second Edition (Harrison & Oakland, 2003; standard score of 54, percentile of .1). His IEP included goals targeting oral

language and listening, functional math (e.g., counting money, telling time), fine motor skills, and pre-vocational skills (e.g., personal safety, following multiple-step directions).

Renee, a special education paraprofessional, supported Thomas in science class. Renee was a European American female with 2 years of experience in special education, both in her current role. Renee had earned a bachelor's degree in an unrelated field. Renee also supported other students with mild, moderate, and severe disabilities in general education and self-contained settings. Renee was supervised by a European American female special education teacher who had a master's degree, 12 years of experience in special education, including 8 years of experience in her current role.

Steven and Susan. Steven was a 12-year-old European American male with intellectual disability in the sixth grade. He used a combination of verbal speech, gestures, and a speech-generating device to communicate. During the research study, Steven's speech-generating device was not available because it was broken and sent to the manufacturer for repair. According to notes from baseline observations, Steven's verbal speech was difficult for some of his peers to understand, and he typically only spoke in 2-3 word utterances. He received both speech and occupational therapy services. Steven was enrolled in four general education classes, including reading, social studies, study hall, and related arts classes (e.g., art, physical education, music). Steven's IEP included goals targeting improved communication and speech, basic literacy, functional math (e.g., telling time, counting money) and increased independence with daily living skills. His IEP reported the following assessment scores: Differential Ability Scales, Second Edition (Elliot, 2007; standard score of 37, percentile of <.1); and the Adaptive Behavior Assessment System, Second Edition (Harrison & Oakland, 2003; standard score of 43, percentile of .1).

Susan, a special education paraprofessional, supported Steven in science class. Susan was a European American female with 8 years of experience in special education, all in her current role. Susan's highest level of education was a high school diploma. Susan also supported a number of other students with mild or moderate disabilities in general education classrooms. Renee was supervised by a European American female special education teacher who had a master's degree and 3 total years of experience in special education, all in her current role.

Olivia and Erin. Olivia was a 10-year-old African American female with autism in the fifth grade. She used a combination of vocalizations, gestures, and a speech-generating device to communicate. According to notes from baseline observations, her speech-generating device was present during observations but was almost always turned off and inaccessible to Olivia. Olivia's special education teacher reported that peers were sometimes apprehensive around Olivia because she was bigger than most of her classmates and sometimes engaged in vocal outbursts and stereotypic behavior (e.g., body rocking, hand washing movements, repetitive touching of face). Olivia was enrolled in four general education classes including math, science, reading, and physical education. Olivia's IEP included goals targeting communication with her peers, improved communication of her needs and wants, functional literacy skills (e.g., recognizing signs), functional math skills (e.g., recognizing coins) and fine motor skills. Her IEP reported the following assessment scores: Differential Ability Scales, Second Edition (Elliot, 2007; standard score of 40; percentile of 0.1); Vineland Adaptive Behavior Scales, Second Edition (Sparrow, Cicchetti, & Balla, 2005; standard score of 55, percentile of 0.1).

Erin, a special education paraprofessional, supported Olivia throughout the school day. Erin was a European American female with 14 years of experience in special education, including 2 years of experience in her current role. Erin's highest level of education was a high

school diploma. Erin's primary responsibility was to support Olivia's needs throughout the school day in a combination of inclusive and self-contained settings, although she did also support one other student with a severe disability during one class period. Erin was supervised by a European American female special education teacher who had a master's degree, 25 total years of experience in special education, including 7 years of experience in her current role.

Peers without Disabilities

Special education teachers, general education teachers, and paraprofessionals worked together to select peers whom they believed would be good candidates to provide support to students with disabilities, and might themselves benefit from providing support. I instructed teachers to select peers who (a) were already enrolled in the same class as the focal student, (b) did not have a severe disability, (c) had a good record of attendance, (d) worked well with adults, and (e) had a history of positive interactions with the student with a disability. Although they consulted the paraprofessionals and general education teachers, special education teachers were ultimately responsible for selecting and inviting peers.

Across participants, teachers invited 12 peers to provide support to students with disabilities. Eleven students agreed to participate and returned assent and parental consent forms; the remaining peer indicated he was interested but forgot to give the consent form to his parent. Two sixth-grade peers supported Destiny, including one European American female and one European American male. Both peers were reported to have learning disabilities. The female peer sometimes worked with Destiny during small-group activities during baseline observation. Three eighth-grade peers supported Thomas, including two European American males and one European American female. One of the male peers occasionally interacted with Thomas and helped him participate in small-group activities during baseline observation. Three sixth-grade

peers supported Steven, including two European American females and one European American male. One of the female peers had a younger sibling with autism. The other female peer had approached the paraprofessional about helping Thomas with his academic work during baseline observation. Three fifth-grade peers supported Olivia, including two African American females (twins), and an Asian-American female. Erin reported that all three peers had shown an interest in interacting with Olivia and sat with her most days during lunch.

School and Classroom Settings

I recruited participants from two local school districts. I approached prospective schools through special education administrators and school principals. When special education teachers contacted me, I met with them individually to share an overview of the study and confirm they worked with students who met inclusion criteria. The first three participants (Destiny, Thomas, and Steven) attended two different middle schools in a school district serving rural and suburban communities. One school served more than 800 students, approximately 90% of whom were European American and about one sixth receiving free or reduced-price lunch. The second school served more than 500 students, approximately 90% of whom were European American and less than ten percent receiving free or reduced-price lunch. The fourth participant (Olivia) attended a middle school that served more than 700 students in a large urban school district. Approximately half of the student body at this school was European American and just over half received free or reduced-price lunch. All schools were located in the southeastern United States. Across participants, the classrooms in which peer support arrangements were implemented included 22-35 students.

Destiny's Class. Destiny attended a 50-min sixth grade science class each morning. Based on baseline observations, 70.2% of class consisted of large-group instruction, 9.4%

entailed small-group instruction, and 43.8% entailed independent seatwork. (Percentages do not add to 100% because instructional formats were recorded every 10 min, and some 10-min intervals included more than one instructional format.) Small-group instruction most often involved laboratory activities. Students usually sat at clusters of 4-5 desks, although the seating arrangement occasionally varied based on the nature of some assignments (e.g., the desks would occasionally be rearranged so students could work at laptop computers and cords would reach power outlets). Destiny sat in a cluster of desks with peers without disabilities before and after the peer support arrangement began, although sometimes she would leave class to complete independent work with Darrell in a resource room. Prior to intervention, Destiny was in close proximity to peers without severe disabilities for an average of 88.5% of the class period (range = 52.7-100%). Darrell (paraprofessional) either sat in a rolling chair or stood within a few feet of Destiny. In addition to Darrell and the general education teacher, there typically was one other special education paraprofessional in the classroom who was responsible for supporting students with mild disabilities. Destiny was the only student with a severe disability enrolled in the class.

Thomas's Class. Thomas attended a 50-min eighth-grade science class each afternoon. Students sat at nine different rectangular tables, with 3-4 students at each table. Approximately 75.0% of class consisted of large-group instruction, 4.7% entailed small-group instruction, 4.8% entailed students working with partners, and 32.5% entailed independent seatwork. Prior to intervention, Thomas was in close proximity to peers without severe disabilities an average of 98.6% of the class period (range = 95.1-100%). Renee typically sat at the same table beside Thomas. In addition to Renee and the general educator, there typically was also a special education teacher in the classroom who was responsible for supporting students with mild

disabilities. One other student with a severe disability was enrolled in the class and sat at a different table from Thomas.

Steven's Class. Steven attended a 50-min sixth grade science class each morning. Students almost always sat at clusters of 4-5 desks, although they occasionally visited the library where 4 students sat at each table. Steven sat in a cluster of desks with peers without disabilities before and after the peer support arrangement began. Approximately 83.7% of class consisted of large-group instruction, 17.3% entailed small-group instruction, 1.7% entailed students working in partners, and 44.3% entailed independent seatwork. Prior to intervention, Steven was in close proximity to peers without severe disabilities for an average of 93.5% of the class period (range = 71.1-100%). Susan (the paraprofessional) sat at one of the desks in the same cluster as Steven. Aside from Susan and the general education teacher, there were typically no other adults in the classroom. Steven was the only student with a severe disability enrolled in the class.

Olivia's Class. Olivia attended a sixth-grade science and math block each afternoon. Although the entire block lasted about 90 min, Olivia rarely attended more than the first 45 minutes. Class-wide instructional formats in this class included large-group (55.0% of 10-min intervals), small-group (16.3%), partners (4.9%) and independent seatwork (45.6%). Most students sat in rows of desks facing a blackboard and a projector screen. However, Olivia sat at a large table in the back of the room with Erin (the paraprofessional). The table was oriented so Olivia would have to turn her body to the left to see the blackboard or projector screen. Prior to intervention, Olivia was in close proximity to peers without severe disabilities for an average of 2.5% of the class period (range = 0.0-16.0%), usually during transition times when Olivia stood in line with other students or when another student would come to the back of the room. Erin delivered one-to-one instruction for the bulk of the class period, with short breaks during which

Olivia went for a walk, used the bathroom, or sat quietly by herself. Sometimes Olivia would fall asleep during class, which Erin and the special education teacher attributed to changes in her medication. In addition to the general education teacher and Erin, the special education teacher (Erin's supervising teacher) and a student teacher were also typically in the classroom. Olivia was the only student with a severe disability enrolled in the class.

Experimental Design and Procedures

I used a multiple-probe-across-participants design, which involves repeated intermittent measurement of the dependent variable and staggered introduction of the independent variable across participants (Gast, 2010). All participants began the study in the baseline condition. The order in which the intervention was introduced to participants was based on whether baseline data patterns were stable (i.e., flat trend of paraprofessional facilitation and student interations) and when special education teachers and paraprofessionals were available outside of school time for professional development.

Baseline procedures. The baseline condition involved direct paraprofessional support without additional training from the supervising teacher. I instructed paraprofessionals to provide support to students with severe disabilities just as they had prior to the study. I instructed supervising teachers not to provide any training to paraprofessionals directly related to peer support arrangements. Paraprofessional behavior related to encouraging focal students and peers to interact and work together during the baseline phase is described in the results section.

Pre-intervention procedures. During the baseline condition, I met with supervising teachers about how to deliver professional development about peer support arrangements. After this session, teachers worked with general education teachers and paraprofessionals to identify 2-3 peers to provide support to students with severe disabilities during the intervention condition.

Teacher training. Shortly before the intervention condition began, I provided a 4.5-hr, one-to-one orientation session with the teacher who would train the paraprofessional. This training focused both on peer support implementation and professional development components. I provided an intervention manual detailing all implementation steps associated with implementation of peer support arrangements, and I described and modeled each implementation step. Implementation steps were grouped into three sections: (a) development of a peer support plan, (b) orientation with peers, and (c) facilitation of social interactions and academic support between peers and focal student. In addition, I provided a professional development implementation checklist (see Appendix F), and I described and modeled each implementation step associated with professional development. Professional development implementation steps were grouped into three sections including initial training session, video models, and facilitation of interactions and academic support. (Specific implementation behaviors are described in detail in the subsequent Intervention section.) At the end of the training, teachers were asked to conduct a mock abbreviated training while pretending I was the paraprofessional. This mock training ensured teachers were prepared to implement all professional development components correctly. When a teacher did not correctly follow an implementation step, I provided corrective feedback and asked the teacher to repeat the step. All four teachers successfully implemented all training steps by the end of the 4.5-hr training session.

Peer recruitment. During the baseline condition, I directed the supervising teacher to work with the general education teacher and paraprofessionals to identify peers who would provide support in the intervention condition. The general educator sent consent forms home with the nominated peers, collected signed forms, and returned these forms to the special

education teacher.

Intervention. The intervention condition involved two levels of intervention: teacher-delivered professional development for paraprofessionals, and paraprofessional facilitation of peer strategies to benefit students with severe disabilities. Teacher-delivered paraprofessional development involved a three-part training package: (a) a 2-hr initial training session, (b) access to two online video models, and (c) one 1-hr performance feedback session. Paraprofessional facilitation of peer support arrangements involved (a) holding a 45-min orientation meeting with peers who would provide support, (b) use of facilitation strategies to promote peer support with direct training from the supervising teacher, and (c) continued use of facilitation strategies after the formal training was complete.

Initial paraprofessional training session. Once teachers were trained and peers recruited, teachers delivered an initial 2-hr training session to paraprofessionals. During this training session, the teachers (a) explained the rationale for peer support arrangements, (b) outlined implementation steps associated with peer support arrangements, (c) explained and provided examples of specific strategies for how to facilitate peer interactions and academic support (see Appendix C), and (d) provided a preview of the other components of the training package (i.e., video models and performance feedback). The teacher conveyed the implementation steps in multiple ways, including verbal description, provision of an intervention manual, and showing video models of implementation steps (provided by the research team). In addition, the teacher guided the paraprofessional to create a peer support plan (see example in Appendix A). Peer support plans outlined potential roles for focal students, peers, and the paraprofessional during different instructional contexts or activities that typically made up the class (e.g., lecture, laboratory experiments, independent work time). When developing plans, teachers and

paraprofessionals were directed to first consider how focal students could participate independently, and then brainstorm how peers could provide support to enhance class participation and interaction. Finally, they discussed how paraprofessionals might encourage peers and focal students to interact and work together. All components of the 2-hr initial training session are described in Appendix F.

Orientation with peers. After the initial training session, paraprofessionals held an orientation meeting with the 2-3 peers (who were identified during the baseline condition). All meetings were held in empty classrooms. Paraprofessionals coordinated the timing of orientation meetings based on if and when general education teachers were willing to excuse the peers from class. Meetings were held during the focal class, a different class, or lunch. I attended all meetings to measure fidelity of implementation. During this orientation meeting paraprofessionals shared (a) a rationale for peer support arrangements, (b) background about the focal student with severe disabilities, (c) general goals of peer support including promoting social interactions and academic engagement, (d) the importance of confidentiality and respectful language, (e) expectations specific to the classroom (e.g., sitting with student, checking in with the paraprofessional), (e) individualized strategies to provide support from the peer support plan, and (f) guidance on when to seek assistance from the general educator or paraprofessional (Carter, Cushing, & Kennedy, 2009). Paraprofessionals also solicited and answered questions from the peers about their new roles. In addition, paraprofessionals explained to students that the peer support arrangement would begin with the next class meeting, and that the seating arrangement would change to allow peers to sit next to the student with a disability.

Paraprofessional facilitation of social interactions and academic support. On the first class meeting after holding the orientation session with peers, the paraprofessionals began to

facilitate peer support arrangements using the facilitative strategies introduced in the initial training. These strategies include prompting social interactions, reinforcing social interactions, providing information for social interaction, prompting academic support, reinforcing academic support, providing information for academic support, prompting proximity, and checking-in with peers (see Table 1 for operational definitions of facilitation behaviors; additional examples and non-examples can be found in Appendix E).

Video models of facilitation. Paraprofessionals viewed two (researcher-created) 10-min video models of facilitating social interactions and academic support between peers and the focal student. Video models were designed to follow-up the initial training session by reviewing and providing examples of facilitation behaviors. The first video focused on facilitating social interactions, and the second video focused on facilitating academic support between peers and the focal student. These videos featured graduate students demonstrating the behaviors with middle and high school students with and without disabilities in mock settings. Immediately after the orientation with peers, I sent the paraprofessional an email containing electronic links to access the videos from an online video-sharing website. Each video included a description of specific strategies to facilitate interactions between peers and the student with severe disabilities (see Appendix C), a video model of an adult using these strategies, and a prompt to the paraprofessional to list ways he or she might use these strategies. The teacher asked the paraprofessional to see completed lists from both videos, and reminded the paraprofessional to view the videos if he or she had not already done so.

Performance feedback. At least one week after the paraprofessional had begun implementation of the peer support arrangement, teachers delivered a 1-hr performance feedback session to paraprofessionals. First, teachers either conducted a live observation in the classroom,

Table 1

Paraprofessional Behaviors, Definitions, and Examples

Behavior	Definition	Example
Paraprofessional support	Paraprofessional does one or more of the following: prompts or reminds students to stay close together by sitting together or joining the same group; prompts, reinforces, or provides information to promote social interaction; prompts, reinforces, or provides information to promote academic support; checks in with peers to ensure they are comfortable in role or offer help. This definition is an umbrella category for any paraprofessional facilitation behavior (below).	See examples of any specific facilitation strategy below.
Prompt social interaction	Paraprofessional encourages or suggests a way for the focal student to interact with a peer, or a peer with the focal student.	Paraprofessional points to a symbol on augmentative communication device to prompt the focal student to answer a question from a peer.
Reinforce social interaction	Paraprofessional praises the focal student and/or peer for social interactions (verbally or with gestures).	The paraprofessional gives the focal student a 'thumbs up' when he greets a peer.
Provide information for social interaction	Paraprofessional provides information to peers that might help peers to better interact with the student. This includes information about how the focal student communicates, interpreting the focal student's behavior, the focal student's interests, and possible conversation topics.	Paraprofessional says to peer, "Sometimes when Dylan rocks back and forth, it's his way of letting you know he is anxious and needs some space."
Prompt academic support	Paraprofessional encourages or suggests a way for peers to work with the focal student to help him/her participate in class.	Paraprofessional says to peer, "Maybe after the lecture, you could explain to Sarah in a few sentences what it was about."
Reinforce academic support	Paraprofessional praises the peers for the way they are working with the focal student to help him/her participate in class.	Paraprofessionals says to peer, "That was really smart to think of helping Marty outline his paper so he could go back and fill in the information."
Provide information for academic support	Paraprofessional provides information to peers so that they might better support the student. This includes information about strengths and needs related to class participation, accommodations and modifications, and instructional strategies.	Paraprofessionals says to peer, "Olivia has a really hard time writing. Maybe she could tell you the answer and you could write it down."
Prompt proximity	Paraprofessional prompts the focal student and peers to be in close proximity (verbally or with gestures).	Paraprofessional asks the focal student to sit by a peer so they can partner for an activity
Check-in with peers	Paraprofessional communicates with peers to see if they are comfortable in their role providing support, if there is anything they want to talk about or discuss, or if there would like assistance from the paraprofessional.	Paraprofessional says to peer, "You look frustrated. Is there something I can do to help?"

or watched a video recording of the paraprofessional and students in the classroom. Two teachers chose to conduct live observations, while the other two chose to watch video recordings. Paraprofessionals collected video recordings by setting up a video recorder on a tripod or stable surface so that the focal student, peers, and paraprofessional were all visible in the frame. Observations were at least 30 min in length. After observing, teachers met with paraprofessionals after school to conduct a performance feedback session. Specifically, the teacher reinforced examples of excellent implementation and provided feedback about how to take advantage of missed opportunities for facilitation. Then the teacher and paraprofessional discussed steps that could be taken to improve facilitation of peer support. I was present at each performance feedback session to collect implementation fidelity data.

Maintenance of paraprofessional implementation. After training was complete, teachers instructed paraprofessionals to continue facilitating peer support through the remainder of the semester. Although the teachers did not deliver any additional formal training, they were free to support paraprofessionals by (a) initiating informal discussions with paraprofessionals about facilitation of peer support arrangements, and (b) being responsive to paraprofessional questions and requests for guidance.

Self-monitoring. Only Darrell used a self-monitoring system. Because Darrell's facilitation of peer support was inconsistent after receiving the complete training package, I asked Darrell to complete a self-monitoring checklist each day. I gave Darrell a folder with enough checklists for the rest of the study, and a vibrating timer set to 15 min. Every 15 min, Darrell recorded whether he had engaged in any facilitation behaviors (i.e., prompting, reinforcing or providing information for social interactions; prompting, reinforcing, or providing information for academic support).

Teacher procedural fidelity. I used an implementation checklist (see Appendix F) to measure the degree to which each supervising teacher implemented the professional development steps with fidelity. I was present for the initial training session and performance feedback session, and assessed implementation as I observed. If a step was not independently implemented with fidelity by the teacher, I recorded the step as incorrect and provided corrective feedback to ensure the training package was implemented correctly. Unprompted implementation fidelity of the training package was calculated as the number of steps implemented correctly (prior to receiving corrective feedback) divided by the total number of steps. Teachers independently implemented almost all steps correctly. Erin's supervising teacher independently implemented all 41 steps correctly (100%), both Renee and Susan's supervising teacher implemented 40 steps correctly (97.6%), and Darrell's supervising teacher independently implemented 39 steps correctly (95.1%). All errors involved teachers completely omitting a step (e.g., neglecting to provide an example of reinforcing social interactions), with no clear pattern in errors across teachers (i.e., no two teachers omitted the same step). I provided corrective feedback immediately after all implementation errors so that all paraprofessionals would receive the complete professional development package as designed. I confirmed teachers had followed up with paraprofessionals regarding video models by obtaining worksheets completed in conjunction with watching videos. Teachers ensured paraprofessionals watched both video models as directed.

Dependent Measures and Recording

Orientation meeting with peers. I used an implementation checklist (see Appendix B) to measure the degree to which paraprofessionals implemented the initial orientation meeting with peers with fidelity. Correct implementation of the orientation meeting was calculated as the

number of steps implemented correctly divided by the total number of steps. If a step was not independently implemented with fidelity by the paraprofessional, I recorded the step as incorrect and provided corrective feedback to ensure the meeting was implemented correctly. Unprompted implementation fidelity of the orientation meeting was calculated as the number of steps implemented correctly (prior to receiving corrective feedback) divided by the total number of steps.

Classroom observations. Two to five times each week, a member of the research team collected data in the general education classroom in which the student with severe disabilities was enrolled. Observers asked the general education teacher for guidance on how to position themselves in proximity to the paraprofessional and the focal student without interfering with classroom activities. Observers collected data from the moment the student entered the classroom (often during a passing period) until the moment the student left the classroom. Data collectors used an interval timer smartphone application (e.g., A HIIT Interval Timer by Pimpim Mobile) and a paper-and-pencil data collection sheet (see Appendix D). The data collector observed the paraprofessional and student with severe disabilities for 10 s, and then took 10 s to record whether behaviors of interest occurred in the previous observation interval. The interval timer was set to vibrate every 10 s and direct the data collector whether to observe or record. Behaviors of interest (operationally defined in Tables 1 and 2) included whether (a) the focal student was in proximity to peers, (b) the paraprofessional used facilitative strategies, (c) the focal student interacted with a peer, (d) a peer interacted with the focal student, and (e) the focal student was engaged in academic activities consistent with the rest of the class. All measures were converted to the percentage of intervals in which a behavior occurred during the observation session.

Table 2

Student Behaviors, Definitions, and Examples

Behavior	Definition	Example
Focal student interaction	Focal student directs verbal or nonverbal (e.g., gestures, signs) communicative behaviors toward a peer without severe disabilities. This definition includes use of a communication system (e.g., PECS, AAC device) to communicate toward a peer.	The focal student gives/shows a peer his artwork (with or without speech).
Peer interaction	Peer without severe disabilities direct verbal or nonverbal (e.g., gestures, signs) communicative behavior toward focal student. If a peer initiates toward a group of students including the focal student, code as an interaction if the peer's interactive behaviors clearly directed toward or includes the focal student.	A peer asks the focal student, "What are you going to do this weekend?"
Proximity to peer	Focal student is sitting or standing beside or across from peer without severe disabilities. No more than one meter separates the focal student and the peer.	The SWD and a peer are sitting in desks that are side-by-side.
Consistent engagement	*Engagement:* Focal student is looking at materials (e.g., textbook, worksheet, overheads) related to ongoing instructional activities, looking at the teacher, writing related to the assigned activity, following teacher instructions/directions, raising hand, or asking questions of the teacher about instructional activities. *Consistent:* Focal student is engaged in or attending to instructional activities and/or tasks assigned by the teacher or the paraprofessional that are consistent or aligned with the content provided to the majority of the class (i.e., identical or appropriately modified from the class curriculum with respect to difficulty, modality, response format, length and/or materials).	The focal student is listening to the same lecture as the rest of the class (body/head oriented toward teacher)

Observer Training and Interobserver Agreement

Observer training. Observers included five graduate students in special education. I provided observers with a training manual that included definitions of all codes (see Appendix E). In two 2-hr training sessions, I reviewed the training manual with observers, and provided verbal, written, and video examples and non-examples of all codes. Observers did not collect primary intervention data until they met the following criteria: 100% accuracy on a written test of coding definitions, at least 90% accuracy on all variables when coding three 10-min video recordings, and at least 90% agreement with an expert coder on all variables in a live setting.

Reliability. A secondary observer collected data on 33.7% of classroom observations, balanced across study participants and experimental conditions. Agreement was calculated for each variable in three ways: (a) total agreement (i.e., the number of intervals the secondary observer coded the same variable [occurrence or nonoccurrence] as the primary observer divided by the total number of intervals); (b) occurrence agreement (i.e., the number of intervals both

Table 3

Interobserver Agreement on All Dependent Measures

Measure	Overall	Occurrence	Non-occurrence
Total interactions with peers	97.2 (91.5-100)	85.2 (50-100)	98.1 (92.8-100)
Peer interactions toward focal student	97.2 (91.4-100)	83.2 (50-100)	98.1 (91.7-100)
Focal interactions toward peer	98.3 (89.1-100)	81.0 (50-100)	99.1 (93.1-100)
Academic engagement	91.8 (81.1-100)	87.8 (25-100)	87.8 (39.6-100)
Proximity to peers	99.2 (94.1-100)	99.0 (82.1-100)	83.1 (0.0-100)
Total paraprofessional facilitation behaviors	99.3 (96.7-100)	85.8 (20-100)	99.7 (98.2-100)
Prompt social interactions	99.9 (99.2-100)	83.0 (0-100)	100.0 (99.4-100)
Reinforce social interactions	100.0 (100-100)	—	100.0 (100-100)
Provide information for social interactions	100.0 (100-100)	—	100.0 (100-100)
Prompt academic support	99.6 (98.2-100)	83.3 (0.0-100)	99.7 (98.2-100)
Reinforce academic support	99.8 (98.1-100)	54.2 (0.0-100)	99.9 (99.4-100)
Provide information for academic support	99.9 (98.3-100)	59.5 (0.0-100)	100.0 (99.4-100)
Prompt proximity	100.0 (99.4-100)	100.0 (100-100)	100.0 (99.4-100)
Check-in with peers	99.9 (98.3-100)	50.0 (0.0-100)	99.9 (98.3-100)

coders coded the occurrence of the same variable divided by the number of intervals the primary observer coded the occurrence of the variable); and (c) nonoccurrence agreement (i.e., the number of intervals both coders coded the nonoccurrence of the same variable divided by the number of intervals the primary observer coded the nonoccurrence of the variable; Gast, 2010). Overall, occurrence, and nonoccurrence data for all primary (i.e., graphed) dependent variables exceeded 85%. In three cases, occurrence agreement for certain low-frequency paraprofessional behaviors was below 80% (i.e., reinforcement of academic support, information for academic support, check-in with peers). Inter-observer agreement for all variables is reported in Table 3.

Social Validity

After the experiment was over, I asked each teacher and paraprofessional to complete a questionnaire about the acceptability and feasibility of the training package. Surveys asked teachers and paraprofessionals to characterize (a) how they viewed the acceptability and feasibility of the VMPAC training package, (b) how they viewed the acceptability and feasibility of peer support arrangements, (c) the likelihood that teachers might offer and paraprofessionals might participate in similar training in the future, and (d) the likelihood that teachers and paraprofessionals would implement peer support arrangements in the future. Each question was rated on a 5-point scale. For questions about perceived relative efficacy, anchors included much less effective, somewhat less effective, about the same, somewhat more effective, and much more effective. For questions regarding difficulty of implementation, anchors included not difficult at all, a little difficult, somewhat difficult, quite difficult, and extremely difficult. For questions about likelihood of future behavior, anchors included not at all likely, a little likely, somewhat likely, quite likely, and extremely likely. In addition, teachers were asked three and

paraprofessionals were asked six open-ended questions about their experience. For a complete list of the questions, see Appendix G.

CHAPTER III

RESULTS

Paraprofessional Implementation of Initial Meeting with Peers

After receiving the initial training session, including viewing a video model on implementation of the initial meeting with peers, paraprofessionals implemented most steps of the initial meeting with peers with fidelity. Erin and Susan independently implemented eight of the ten steps correctly (80%), while Darrell and Renee independently implemented all ten steps correctly (100%). All errors involved paraprofessionals completely skipping an implementation step; in no case did paraprofessionals attempt to implement a step but do so incorrectly. I provided corrective feedback immediately after all implementation errors so that all peers would experience the initial orientation meeting as designed.

Paraprofessional Facilitation of Peer Support Arrangements

All four paraprofessionals increased the frequency with which they demonstrated facilitation behaviors associated with peer support arrangements immediately after receiving initial training, although in most cases this increase was modest (see Figure 1). Frequency of facilitation behaviors maintained but did not sharply increase after teachers delivered performance feedback in a performance feedback session. Across all paraprofessionals, academic facilitation behavior was more frequent than social (see Table 4).

Darrell did not demonstrate any facilitation behaviors during the baseline condition. After receiving the initial training session and access to the video models, the frequency of Darrell's facilitative behavior increased to an average of 2.0% of intervals (range = 0.0%-7.2%). Most

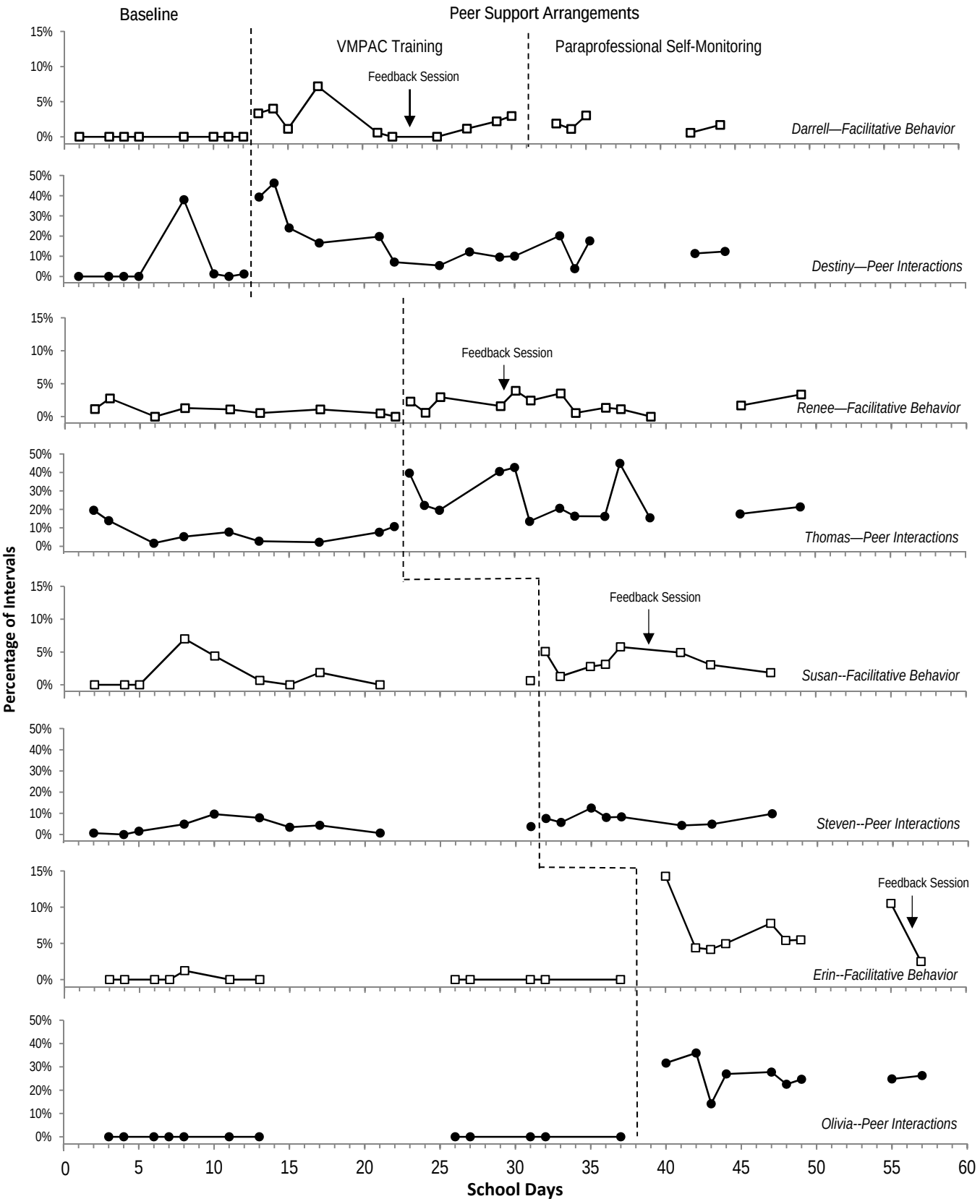

Figure 1. Paraprofessional behaviors facilitating peer support (open squares) and interactions between students with disabilities and their peers (filled circles).

Table 4

Percentage of Observation Intervals with Interactions, Academic Engagement, Proximity to Peers, and Paraprofessional Facilitation of Peer Support by Participant and Condition

Measure	Destiny and Darrell		Thomas and Renee		Steven and Susan		Olivia and Erin	
	Baseline	Intervention	Baseline	Intervention	Baseline	Intervention	Baseline	Intervention
Total interactions with peers	5.1 (0.0-38.0)	16.4 (3.9-46.3)	7.9 (1.6-19.5)	25.4 (13.5-44.9)	3.1 (0.0-9.6)	7.2 (1.4-12.5)	0.0 (0.0-0.0)	23.8 (3.9-36.0)
Peer interactions toward focal student	4.9 (0.0-37.0)	15.7 (3.9-45.7)	6.6 (1.1-15.5)	23.4 (12.9-44.3)	2.7 (0.0-7.0)	5.7 (1.4-9.8)	0.0 (0.0-0.0)	23.8 (3.9-36.0)
Focal student interactions toward peer	2.8 (0.0-21.0)	6.7 (0.6-24.0)	6.4 (1.1-19)	16.3 (6.7-30.3)	1.7 (0.0-6.1)	5.2 (1.4-9.7)	0.0 (0.0-0.0)	1.5 (0.0-13.3)
Academic engagement	72.9 (52.7-90.9)	66.1 (41.8-81.1)	44.0 (1.1-79.8)	35.7 (13.5-68.1)	25.4 (7.0-52.2)	22.2 (1.2-39.9)	23.5 (4.3-61.4)	9.4 (0.0-25.5)
Proximity to peers	88.5 (52.7-100)	98.4 (86.7-100)	98.6 (95.1-100)	98.4 (94.7-100)	93.5 (71.1-100)	93.6 (76.4-100)	2.5 (0.0-16.0)	49.3 (27.5-100)
Total paraprofessional facilitation behaviors	0.0 (0.0-0.0)	2.0 (0.0-7.2)	0.9 (0.0-2.8)	2.0 (0.0-3.9)	1.4 (0.0-7.0)	3.4 (1.3-5.8)	0.1 (0.0-1.2)	5.7 (2.0-14.3)
Prompt social interactions	0.0 (0.0-0.0)	0.5 (0.0-3)	0.2 (0.0-0.6)	0.1 (0.0-0.6)	0.0 (0.0-0.0)	0.0 (0.0-0.0)	0.1 (0.0-1.2)	0.4 (0.0-1.7)
Reinforce social interactions	0.0 (0.0-0.0)	0.0 (0.0-0.0)	0.0 (0.0-0.0)	0.0 (0.0-0.6)	0.2 (0.0-1.8)	0.3 (0.0-1.2)	0.0 (0.0-0.0)	0.0 (0.0-0.0)
Provide information for social interactions	0.0 (0.0-0.0)	0.0 (0.0-0.0)	0.0 (0.0-0.0)	0.0 (0.0-0.0)	0.1 (0.0-0.7)	0.2 (0.0-1.2)	0.0 (0.0-0.0)	0.1 (0.0-0.9)
Prompt academic support	0.0 (0.0-0.0)	0.9 (0.0-2.8)	0.5 (0.0-1.1)	1.0 (0.0-3)	0.3 (0.0-3.5)	1.5 (0.0-3.2)	0.0 (0.0-0.0)	1.9 (0.0-8.2)
Reinforce academic support	0.0 (0.0-0.0)	0.4 (0.0-2.8)	0.3 (0.0-1.7)	0.3 (0.0-1.2)	0.5 (0.0-2.1)	0.8 (0.0-1.9)	0.0 (0.0-0.0)	0.0 (0.0-2.0)
Provide information for academic support	0.0 (0.0-0.0)	0.2 (0.0-1.1)	0.0 (0.0-0.0)	0.4 (0.0-1.8)	0.2 (0.0-1.8)	0.4 (0.0-2.1)	0.0 (0.0-0.0)	1.4 (0.0-3.1)
Prompt proximity	0.0 (0.0-0.0)	0.0 (0.0-0.0)	0.0 (0.0-0.0)	0.0 (0.0-0.0)	0.0 (0.0-0.0)	0.5 (0.0-1.9)	0.0 (0.0-0.0)	0.1 (0.0-1.1)
Check-in with peers	0.0 (0.0-0.0)	0.1 (0.0-1.1)	0.0 (0.0-0.0)	0.2 (0.0-1.1)	0.0 (0.0-0.0)	0.0 (0.0-0.0)	0.0 (0.0-0.0)	1.1 (0.0-2.7)

(74.4%) facilitative behavior was related to academic support (i.e., prompting, reinforcing, or providing information for academic support). The frequency of Darrell's facilitative behavior was greatest in class sessions immediately following initial training. Neither the performance feedback session nor introduction of a self-monitoring system resulted in a large increase in facilitative behaviors, although behavior was less variable with the self-monitoring system.

Renee's facilitation behavior during the baseline condition was relatively infrequent and variable (*M* = 0.9% of intervals, range = 0.0-2.8%). After receiving the initial training session and access to the video models, the frequency of Renee's facilitative behavior increased to 2.0% of intervals (range = 0.0%-3.9%). Most (86.8%) facilitative behavior was related to academic support. The change in level between conditions was modest, but relatively consistent. Facilitative behavior did increase slightly immediately after the performance feedback session.

Susan's facilitation behavior during the baseline was highly variable (*M* = 1.4% of intervals, range = 0.0-7.0%). After receiving the initial training session and access to the video models, the frequency of Susan's facilitative behavior increased on average to 3.4% of intervals, and decreased in variability (range = 1.3-5.8%). Most (81.3%) facilitative behavior was related to academic support. Frequency of facilitative behavior slightly decreased after the performance feedback session.

Erin only demonstrated one facilitative behavior during the entire baseline condition (*M* = 0.1% of intervals, range = 0.0-1.2%). After receiving the initial training session and access to the video models, the frequency of Renee's facilitative behavior increased dramatically to 5.7% of intervals (range = 2.0%-14.3%). Most (75.2%) facilitative behavior was related to academic support. Facilitative behavior was most frequent immediately after initial training, and decreased after the performance feedback session.

Student Outcomes

Peer interactions. For three of the four students, paraprofessional implementation of peer support arrangements coincided with an immediate and substantial increase in the percentage of intervals with peer interactions. For the third student, peer interactions did not increase substantially. Peer interaction data are displayed in Figure 1, and descriptive statistics for total interactions, interactions from the focal student toward peers, and from the peers toward the focal student are included in Table 4.

Destiny's total interactions with her peers (both from Destiny toward peers and from peers toward Destiny) were very infrequent during baseline (*M* = 5.1% of intervals, range = 0.0-38.0%), with the exception of one day when the class completed lab work in partners. The number of intervals Destiny interacted with peers sharply increased immediately after the introduction of peer support arrangements. After the first few initial observations during the peer support condition, the number of intervals with peer interactions decreased but remained markedly higher than baseline (*M* = 16.4% of intervals, range = 3.9-46.3%).

Of the four participants, Thomas interacted with peers during the most intervals in the baseline condition (*M* = 7.9% of intervals, range = 1.6-19.5%). Despite more frequent interactions during baseline, the number of intervals Thomas interacted with peers increased immediately and substantially after introduction of the peer support arrangement (*M* = 25.4% of intervals, range = 13.5-44.9%). The variability of the data also increased during the peer support condition, which might be related to a rotation of three peers partnering with Thomas during class activities.

Steven interacted with his classmates occasionally during the baseline condition, but the number of intervals with interactions was relatively infrequent and inconsistent (*M* = 3.1% of

intervals, range = 0.0-9.6%). During the two baseline observations with the most intervals with interactions, one of Steven's peers who had completed her own work approached Susan and asked if she could help Steven complete his assignment. Although interactions on average were more frequent during the intervention condition (*M* = 7.2% of intervals, range = 1.4-12.5%), a clear difference in data patterns between phases is not apparent through visual analysis. Steven's ability to interact with his peers might have been hampered by the absence of his speech generating device, which was broken and sent to the manufacturer for repairs for the duration of the study.

Olivia was not observed interacting with her classmates during the baseline condition (*M* = 0.0% of intervals, range = 0.0-0.0%). However, Olivia was rarely in close proximity to her classmates in the baseline condition (*M* = 2.5% of intervals, range = 0.0-16.0%). In addition, Olivia was the only participant in the study who communicated almost exclusively through a speech-generating device, and Olivia's special education teacher reported that her peers were apprehensive about interacting with Olivia due to her occasional vocal outbursts and stereotypic behavior. Immediately after the introduction of peer supports, the number of intervals in which Olivia interacted with peers increased substantially (*M* = 23.8% of intervals, range = 3.9-36.0%). Olivia was also in proximity to her classmates much more frequently during the peer support condition (*M* = 49.3% of intervals, range = 27.5-100%)

Consistent academic engagement. Across all four participants, the percentage of intervals with consistent academic engagement was variable across both baseline and intervention conditions (see Figure 2). Engagement tended to be highest during initial baseline observations, which might reflect paraprofessionals and/or students reacting to the presence of

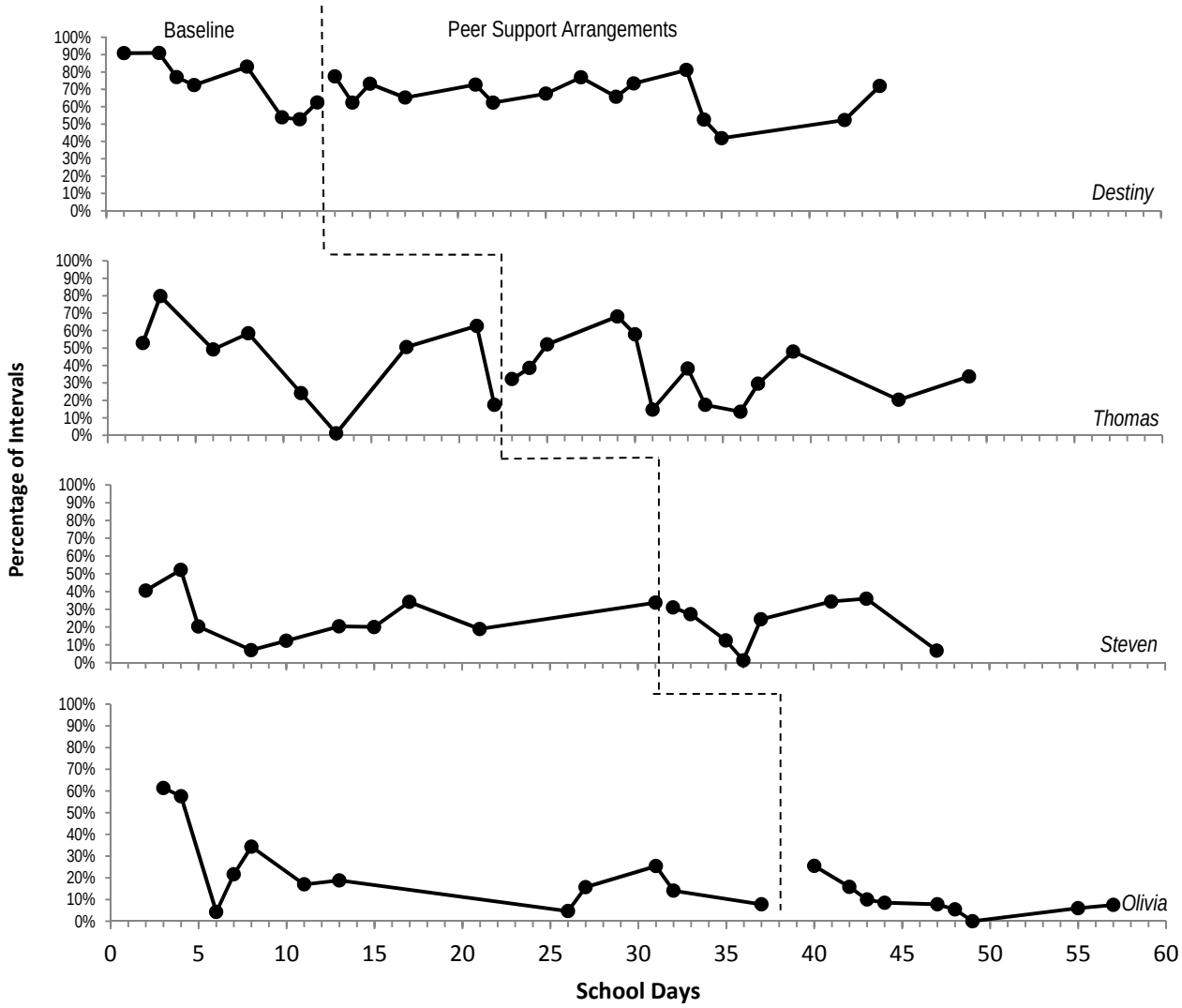

Figure 2. Academic engagement of students with disabilities.

observers before reverting to more typical patterns of behavior (i.e., Hawthorne effect; Gast, 2010). Introduction of peer support arrangements did not appear to coincide with a substantive increase or decrease in consistent academic engagement.

Social Validity

Professional Development Package. All four teachers perceived the VMPAC training package to be much more effective than the methods they usually used to train paraprofessionals. Two teachers indicated it was not at all difficult, and two indicated it was only a little difficult, to find time to implement VMPAC. Teachers indicated that if asked by an administrator, one would be quite likely, and three would be extremely likely, to recommend VMPAC for district-wide training. Two teachers indicated they would be quite likely and two extremely likely to use similar training strategies with paraprofessionals in the future. When asked what they might change about the training package, one teacher suggested including general education teachers in the training process and another suggested equipping paraprofessionals with a simple checklist to track student outcomes (e.g., peer interactions).

Three paraprofessionals perceived the VMPAC training package to be much more effective, and one somewhat more effective, than the training they typically receive. Three paraprofessionals indicated it was not at all difficult to find time to complete the training, while one indicated it was somewhat difficult. All paraprofessionals indicated that if asked for input from an administrator, they would be extremely likely to recommend VMPAC for district-wide training. Two indicated they would be quite likely, and two extremely likely, to participate in future professional development opportunities involving same training model. When asked what they might change about the training package, one paraprofessional suggested having the special education teacher collaborate with classroom (i.e., general education) teacher.

Peer Support Arrangements. Two teachers perceived peer support arrangements to be quite effective, and two as very effective, at improving outcomes for students with severe disabilities. Three teachers indicated they would be extremely likely, and one very likely, to encourage paraprofessionals to continue implementation of peer support arrangements after the conclusion of the research study. Three teachers reported they would be extremely likely, and one quite likely, to support other paraprofessionals in implementing peer support arrangements. Two teachers reported they were quite likely, and two extremely likely, to recommend peer support arrangements to other teachers. When asked what advice they had for other teachers working with paraprofessionals to implement peer support arrangements for the first time, one teacher recommended "being patient because the process does work when all the steps are followed accordingly." Another teacher wrote, "Look for low hanging fruit—quick and easy times and places to turn over what a paraprofessional does to a peer. Give up a little control and don't worry about if it isn't perfect." Other teachers wrote, "Communication [with the paraprofessional] is key" and "take it little by little and be very encouraging."

All paraprofessional perceived peer support arrangements to be extremely effective at improving outcomes for students with severe disabilities. All four also indicated it was not at all difficult to implement peer support arrangements. Two paraprofessionals indicated they were quite likely, and two very likely, to continue implementing peer support arrangements after the conclusion of the research project and to recommend peer support arrangements to other paraprofessionals. When asked for examples of why they thought peer support arrangements were successful, Darrell wrote, "Destiny was shy at the beginning of the school year. She now is more active in class and talks non-stop. Her shy shell is broken." Renee wrote, "Thomas is much more involved when working with his peer group instead of working with me." Susan wrote,

“Before I even get the classroom, the peers are already helping Steven get started on his classwork.” Erin wrote, “Olivia’s peers really enjoy working with her, and I think it shows the [classroom] teacher a little more of what she is capable of.” When asked about the most challenging aspect of implementing peer support arrangements, one paraprofessional wrote, “making sure the peers got their own work done.” Another paraprofessional wrote it was sometimes necessary to “remind peers not to do the work for the student.” Another paraprofessional wrote, “Nothing was challenging for implementing peer supports for this student, but I think it would be tough to do with a student who has behavior problems.” The fourth paraprofessional indicated nothing had been challenging about implementing the peer support arrangement.

CHAPTER IV

DISCUSSION

Individually assigned paraprofessionals commonly support middle school students with severe disabilities in general education classrooms (Suter & Giangreco, 2009). However, this support model often does not promote social outcomes for students with severe disabilities. While peer support arrangements offer an evidence-based alternative to direct paraprofessional support, previous research does not address if paraprofessionals can implement peer support arrangements effectively without substantial researcher involvement or how they might be prepared to do so. This study investigated whether teacher-delivered professional development would enable paraprofessionals to implement peer support arrangements with fidelity, and whether implementation of peer support arrangements would result in improved outcomes for students with severe disabilities. Findings showed special educators delivered professional development accurately, paraprofessionals implemented peer support arrangements with fidelity, and outcomes for three of the four students with severe disabilities improved. These findings extend the research literature regarding teacher-delivered professional development, paraprofessional-implemented peer support arrangements, and the benefits of peer support arrangements for students with severe disabilities.

First, this study shows that given relatively brief training, special education teachers can accurately and effectively administer professional development strategies that enable paraprofessionals to implement peer support arrangements. Despite the expectation that special education teachers train and supervise paraprofessionals (CEC, 2011), this is the first published

study that involved teachers successfully training paraprofessionals to implement an intervention with students who have severe disabilities (for a recent systematic review, see Brock & Carter, in press). Furthermore, teachers perceived the professional development they delivered to be both effective and feasible. Teachers did not have difficulty finding time to implement a 3.5 hr training sequence designed to efficiently package the promising professional development strategies (i.e., modeling and performance feedback). In addition, fidelity measures gave teachers some flexibility. For example, teachers who were unable to conduct live observations watched video recordings of paraprofessional implementation in order to deliver performance feedback. Efficiency and flexibility of training practices is critical, as teachers report they have little time to train and supervise paraprofessionals given their many other responsibilities (Suter & Giangreco, 2009).

Second, findings from this study show that given brief professional development featuring promising training strategies, paraprofessionals can implement peer support arrangements effectively. Previous studies of peer support arrangements have not included paraprofessionals as primary intervention agents, nor have they included strong measures of implementation fidelity. Although findings from this study provide a much clearer picture of what facilitators are doing to establish and facilitate peer support arrangements, it is not clear which implementation steps are most strongly related to student outcomes, or if certain aspects of implementation were adequate or optimal. Implementation of peer support involves multiple components, including development of a peer support plan, an initial meeting with peers, and ongoing facilitation to support students with severe disabilities and their peers as they interact and work together. Fidelity of the first two components is straightforward—the plan must be fully completed in collaboration with a special educator, and the meeting must involve 10

distinct implementation steps. Determining adequate frequency of paraprofessional facilitation of interactions and support between students with disabilities and their peers is less clear. While facilitative behavior did increase for all paraprofessionals, there is no clear standard to judge whether this increase was sufficient or optimal. Findings show paraprofessional implementation of all components of peer support arrangement—including ongoing facilitation—was sufficient to improve student outcomes, but given the measurement strategies and experimental design of this study it is not possible to isolate the relationship between only facilitative behavior and student interactions.

Despite the lack of a clear standard for frequency of paraprofessional facilitation, low rates of some facilitation behaviors were concerning and paraprofessionals might benefit from further professional development. For example, even though training materials gave equal weight to all facilitation behaviors, paraprofessionals tended to prompt students to interact and work together much more often than they reinforced them. This is especially surprising given the length of time peer support arrangements were in place. One might have expected the ratio of prompting to reinforcement to change as peers began providing support with less prompting, but instead rates of reinforcement were consistently low and overall rates of facilitative behavior tended to decline over time. In addition, paraprofessionals seldom focused on facilitation of social interactions. Even though one might have expected a greater emphasis on facilitation of academic support compared to social interactions, promotion of social interactions was strikingly infrequent.

Surprisingly, introduction of self-monitoring and performance feedback—two training strategies that have produced powerful effects in other professional development studies—did not result in discernable increases in paraprofessional facilitation of peer support. In a previous

study that included component analysis of VMPAC (Brock & Carter, 2013), the performance feedback resulted in a marked increase in paraprofessional implementation fidelity of constant time delay. Sutherland and Wehby (2003) found that a combination of performance feedback and self-monitoring improved the frequency that teachers praised students and provided opportunities to respond. The lack of increase in facilitation behaviors after the introduction of these strategies in the present study may be due to a combination of factors. For example, the efficacy of performance feedback might depend on who is providing it. In both the studies by Brock and Carter and Sutherland and Wehby, performance feedback was delivered by members of a research team. It is possible that research team members are simply more skilled at delivering performance feedback than teachers. It is also possible that research team members who are familiar with measurement of the dependent variable might deliver feedback that is more tightly aligned with improvement of the dependent variable. Although all teachers did provide feedback that included at least one suggestion for improving specific facilitation behaviors, teachers also provided general feedback that (while possibly beneficial) did not directly relate to the behaviors measured in this study. In addition, researchers in prior studies delivered feedback based on formal measurement of the dependent variable. Teachers in the present study delivered feedback based on their own observations, during which they were directed to look for positive and negative examples of paraprofessional facilitation. It is also possible that paraprofessionals might respond differently to feedback based on their relationship with the person providing it. Wehby, Maggin, Partin, and Robertson (2011) found higher quality relationships between professional development coaches and teachers were associated with increased quality of practitioner implementation. Because of the limited research, it is unclear if relationships between supervising teachers and paraprofessionals tend to be optimal for coaching. These relationships

are often multifaceted, with teachers taking on a variety of roles, including supervising, evaluating, and working alongside paraprofessionals. The nature of these relationships may make it difficult for teachers to deliver constructive feedback. Alternatively, it is possible that performance feedback and/or self-monitoring enabled paraprofessionals in this study to maintain implementation behaviors, and that without these components, implementation behaviors might have decreased or become more variable. For Darrell, introduction of self-monitoring did coincide with a decrease in the variability of facilitation behavior. Furthermore, unlike the aforementioned randomized-controlled trial by Brock and Carter (2013), this study utilized a single-case design that did not experimentally contrast maintenance of implementation behaviors with and without performance feedback. Finally, paraprofessionals might have benefitted from additional performance feedback beyond the single session.

Third, findings from this study show peer support arrangements implemented by paraprofessionals can improve outcomes for students with severe disabilities. While introduction of peer support arrangements resulted in increased interactions with classmates for three of the four participants with severe disabilities, these increases were more modest compared to previous studies that tested the efficacy of peer support arrangements and used similar strategies to measure percentage of intervals with interactions (i.e., Carter et al., 2007; Carter et al., 2011). On average, participants in the present study experienced a mean increase of 11.0 intervals with interactions between baseline and experimental conditions. Collapsing across the two previous studies, participants experienced a mean increase of 24.9 intervals.

There are a number of plausible explanations for this difference in magnitude of effects. For example, in both previous studies (i.e., Carter et al., 2007; Carter et al., 2011), members of the research team were directly involved in all aspects of implementation, whereas in the present

study paraprofessionals implemented peer support arrangements with only brief professional development from a teacher. It is likely that members of the research team who have more extensive experience with peer-mediated intervention might be more skilled interventionists than paraprofessionals who have no formal training in special education, limited experience with peer-mediated intervention, and are balancing implementation of peer support arrangements with a number of other job responsibilities. Alternatively, contextual factors might explain these differences. For example, the majority of students in the two prior studies attended elective courses (e.g., ceramics, culinary). Across studies, students who attended elective courses experienced an average increase of 30.2% of intervals between conditions while students who attended a core academic course (i.e., science) experienced an increase of only 15.8% of intervals. Another contextual factor is focal student proximity to peers in the baseline condition. Without controlling for this factor, it is possible that merely being in proximity to peers—and not other aspects of implementation—may account for increased interactions. In the present study, Olivia—the only student who was rarely in proximity to peers during the baseline condition—experienced the largest increase in interactions in the peer support condition. Similarly, the participants in Carter et al. (2011)—who across participants were in proximity to peers for about half of intervals in the baseline condition—experienced larger increases in interactions than the three students in this study who across participants were in proximity to peers for 93.5% of intervals. These findings, although descriptive, suggest that while proximity may play a role in the magnitude of effects, peer support arrangements are still effective when proximity to peers is held constant across conditions.

In addition to proximity to peers, instructional context is another factor that may affect the frequency of opportunities for students with severe disabilities to interact with their peers.

Interactions tended to be more common when students were directed to work in partners or in small groups compared to whole-group lecture or independent work time. However, interactions during the baseline condition tended to be low regardless of instructional context. Although certain instructional formats might be more conducive to interactions, intentional planning and support are still needed to ensure positive interactions actually occur. For example, the planning tool developed by teachers and paraprofessionals outlined ways for peers to appropriately support students with severe disabilities during all instructional formats, including lecture (e.g., highlighting key words in one's notes for student to copy; summarizing key points from lecture) or independent work time (e.g., helping student to begin work; occasionally checking in with student and providing encouragement).

Implications for Practice

Findings from this study have implications for special educators and teacher educators. Special educators must provide focused training to paraprofessionals about supporting students in general education classrooms. Prior to focused training, paraprofessionals in this study rarely or inconsistently encouraged students with severe disabilities and their peers without disabilities to interact or work together. Furthermore, simply seating students with severe disabilities next to students without disabilities—without intentional planning and adult facilitation—was not sufficient to ensure students interacted on a regular basis. Given that desired outcomes of inclusion for students with severe disabilities include increased opportunities for communication (Downing, 2005), improvement of social skills (Walton & Ingersoll, 2013), and development of relationships and social networks (Carter, Bottema-Beutel, & Brock, 2014), rare or infrequent peer interaction is not compatible with successful inclusion. Special educators should ensure

higher rates of interaction through implementation of evidence-based strategies such as peer support arrangements.

Teacher educators must re-design teacher preparation programs to emphasize effective training and supervision of paraprofessionals. Special educators report their pre-service training does not prepare them for this responsibility (French, 2001). Effective strategies for training, managing, and supporting paraprofessionals should be an integral part of teacher preparation (CEC, 2011). Pre-service training curricula should align with research literature that shows paraprofessionals can contribute to improved outcomes for students with severe disabilities when provided professional development that is sustained beyond an initial training session, includes effective training strategies (e.g., modeling and performance feedback), and holds paraprofessionals accountable for targeted implementation behaviors (Brock & Carter, in press).

Limitations and Directions for Future Research

Several limitations to this study suggest avenues for future research. First, teachers and paraprofessionals included in this study represent volunteers from a larger pool of potential participants, and it is possible they might be more motivated to work together to implement peer support arrangements than practitioners who did not volunteer. In future studies, researchers might consider techniques to sample larger and more representative samples of teachers and paraprofessionals. Second, although reliability of measurement for the primary (graphed) dependent variables was strong, reliability of measurement for certain facilitation behaviors (e.g., reinforcing academic support) was less than optimal. In future studies, researchers might consider coding low-frequency implementation behaviors from video recordings instead of live observations. Third, this study focused on individual teachers training one paraprofessional who supported a single student. It is not clear if teachers could feasibly train and support larger

numbers of paraprofessionals who work with multiple students. Findings from descriptive studies suggest that high paraprofessional-to-teacher ratios and student caseloads are common, making this an arduous task (Suter & Giangreco, 2009). In future studies, researchers could examine whether it is feasible and effective for teachers to deliver professional development to multiple paraprofessionals. Fourth, teachers only provided performance feedback to paraprofessionals once. Given the complexity of implementing peer support arrangements, repeated coaching sessions with performance feedback might have produced a stronger effect on paraprofessional implementation behaviors. In future studies, researchers could examine the impact of duration and intensity of follow-up professional development.

Conclusion

Findings from this study show that special education teachers can deliver training and support to paraprofessionals that enables them to accurately and effectively implement peer support arrangements for students with severe disabilities. However, scaling up high-quality teacher-delivered professional development for paraprofessionals would likely require systemic changes. Teacher preparation programs do not adequately prepare special education teachers to train and supervise paraprofessionals (French, 2001). Given the potential for well-trained and supported paraprofessionals to positively impact outcomes for students with severe disabilities, effective paraprofessional training and support should be a higher priority in both teacher preparation programs and in public schools.

Example One of Peer Support Plan

The Biology class is a great place for Brad to work on goals related to developing social and conversational skills, as well as expanding his typing and writing skills. Below are some ideas for how Brad might become more involved in class activities during Biology, as well as some ideas for how the peers at Brad's table could support him.

At the beginning of class....

Brad could…	Peers could…	The facilitator could…
• Talk quietly with his peers (when it is okay with the teacher) • Pass out worksheets or other materials to the class (if there are any that day) • Listen and respond to Ms. Hale as she does attendance • Boot up his laptop, if he will be taking notes in class	• Ask Brad about his day or upcoming school events • Help Brad pass out any worksheets • Make sure Brad has all of the same materials for class, such as a book, worksheets, lab materials, etc. • Help Brad get out his notebook, pen, paper, etc. for class	• Try to draw some of the peers at the table into conversation with Brad—you may have to do some modeling or give them some ideas of things they could ask about or prompt Brad to ask questions of his peers • Make sure Brad has the same materials as his classmates, such as a book, any worksheets, paper, pencil, lab materials, etc. • Look through the materials quickly to see if there are any things that could be adapted readily

When there are lectures or whole group instruction...

Brad could…	Peers could…	The facilitator could…
Listen to Ms. Hale as she presents information to the class • Quietly ask his peers questions about the material Ms. Hale is presenting • Take notes by typing important specific key words or phrases that are being written down by a peer (preferably) or the facilitator • Copy by hand those same key words or phrases with the facilitator's help or highlight notes • Turn off/on the lights when Ms. Hale is using the overhead projector	• Make sure Brad has all of the same materials for the activity as they do • As you are taking your own notes, copy down on a separate piece of paper some of the important words or ideas from the class discussion; Brad can then type these as his own notes or copy them down with the facilitator's help. Write fairly large so Brad can see clearly. • Periodically check to make sure Brad is doing okay with typing or writing his notes • Occasionally lean over and quietly summarize a key point or interesting fact for Brad, or ask him simple questions that help him follow along • Encourage Brad with lots of positive feedback such as "Wow, you take really good notes!"	• Make sure Brad has the same materials as his classmates • Always brainstorm ways Brad can be engaged in the discussion: Can he answer a question? Can he share an idea? • Help Brad to take modified notes by typing key words/ phrases on the laptop (preferred) or writing them out by hand • Encourage Brad to look at Ms. Hale or the whiteboard as instruction is taking place • Let the peers know when they are doing a great job interacting with or supporting Brad • Prompt Brad to ask his peers to double check his notes

13

Peer Support Plan: Example One

When there are small group or lab activities...

Brad could…	Peers could…	The facilitator could…
• Listen to Ms. Hale as she presents instructions to the class • Participate in the small group or lab activity • Ask peers for help during his part of the activity	• Make sure Brad has all of the same materials for the activity as they do • Give Brad opportunities to make choices about or give input into the activity. • Even if Brad can't do all of an activity, he can probably still do a part of it. • Encourage Brad with lots of positive feedback such as "That was a great answer!"	• Make sure Brad has the same materials as his classmates for the activity • Always brainstorm ways Brad can be engaged—even in small ways—in the activity: Can he mark the group's answers on the worksheet? Can he be asked his opinion about an answer? • Give peers ideas for questions they can ask Brad or ways they can involve him—think creatively! • Let the peers know when they are doing a great job supporting Brad • Give Brad examples of questions he can ask his classmates

When there is independent seatwork...

Brad could…	Peers could…	The facilitator could…
• Listen to Ms. Hale as she presents instructions to the class • Work with the facilitator to finish the worksheet or other activity • When other peers are done, ask them for help completing his work	• Before beginning your own work, make sure Brad has all of the materials he needs for the activity • When you are finished with your own work, check in to see if Brad could use some help finishing his own work or help double check his answers • Encourage Brad with lots of positive feedback such as "Awesome, you got the answer to number ten!"	• Make sure Brad has the same materials as his classmates for the activity • Work with Brad on completing the activity in a modified way. Can Brad tell you the answer if you read it to him? If you gave him the answer, could he practice typing or writing it down on the worksheet? • Is there an alternative activity Brad could complete? • Let the peers know when they are doing a great job supporting Brad

At the end of class...

Brad could…	Peers could…	The facilitator could…
• Talk quietly with his peers (if everyone's work is completed) • Collect any materials for Ms. Hale • Put away his things • Shut down his computer if he was taking notes in class	• Ask Brad about his day, what he is doing after school, or upcoming events • Help Brad put away his things • Walk with Brad to or part way to his next class	• Make sure Brad has the same materials as classmates • Try to draw all peers at the table into conversation with Brad—you may have to do a little modeling to get things started

APPENDIX B

Initial Meeting Checklist

Facilitator Name: _____ *Date:* _____

Peers Present: _____

☑ = implemented independently; ☒ = implemented after prompting

- ☐ Introductions
- ☐ Rationale for Peers Supports Strategies
- ☐ Background about the Student with a Disability
- ☐ General Goals in this Class
- ☐ Confidentiality and Respectful Language
- ☐ Expectations Specific to the Classroom
- ☐ Peer Support Strategies
- ☐ When to Seek Assistance
- ☐ Discussion and Questions
- ☐ What Happens Next

APPENDIX C

How to Facilitate Peer Support

1. Make sure that the peers are close to the focus student.

Peers must be near the focus student to interact with or provide support.

Ensure that the focus student and peers are in close proximity to one another by:

- Working with the teacher to change the seating arrangement
- Asking or reminding the student and peer to sit together
- Asking the student and peer to join the same group
- Asking the student and peer to partner for an activity

2. To promote social interaction and academic support, prompt, reinforce, and provide information to students.

The peers and focus student will need some encouragement, praise, and information from you in order to be successful. You can prompt, reinforce, and provide information to students that will promote social interaction and academic support.

	Prompt	Reinforce	Provide Information
Social Interactions	Encourage or suggest a way for the focus student to interact with peers, or the peer to interact with the focus student.	Praise the focus student for his interactions with peers, or the peers for their interactions with the focus student.	Provide information to peers that might help peers to better interact with the student, including information about: • How student communicates • Interpreting student's behavior • The student's interests • Possible conversational topics
Academic Support	Encourage or suggest a way for peers to work with the focus student to help him participate in class.	Praise the peers for the way they are working with the focus student to help him participate in class.	Provide information to peers so that they might better support the student, including information about: • Strengths and needs • Accommodations and modifications • Instructional strategies

3. Check in with the peers often to see how things are going and offer your help.

Check in with the peers to see if

- They are comfortable in their role
- There is anything they want to talk about or discuss
- There is anything that you can do to help

APPENDIX D

ID Code _____ Primary Observer Initials _____ Secondary Observer Initials _____ Date _____ Page (circle) 1 2 3 4 5 6 7

Bell	Interval	Student Behaviors				Paraprofessional Behaviors								
		SWD Interaction	Peer Interaction	Proximity to Peer	Consistent Engagement	Prompt Social	Reinforce Social	Information for Social	Prompt Academic	Reinforce Academic	Information for Academic	Prompt Proximity	Check-in	Other
	1													
	2													
	3													
	4													
	5													
	6													
	7													
	8													
	9													
	10													
	11													
	12													
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	21													
	22													
	23													
	24													
	25													
	26													
	27													
	28													
	29													
	30													

Instructional Format: *(check all that apply)*
- ☐ Whole class
- ☐ Small group
- ☐ Partners
- ☐ Independent

Paraprofessional Present: *(check one)*
- ☐ During all intervals student was present
- ☐ > half of intervals student was present
- ☐ < half of intervals student was present
- ☐ Not at all

Peer Supports Present: *(check one)*
- ☐ None
- ☐ 1
- ☐ 2
- ☐ 3

Observer Notes:

APPENDIX E

Definitions, Examples, and Non-examples of Behavior Codes

Focal student Interaction: focal student directs verbal or nonverbal (e.g., gestures, signs) communicative behaviors toward a peer without severe disabilities. This definition includes use of a communication system (e.g., PECS, AAC device) to communicate toward a peer without severe disabilities.

Examples:

- A focal student gives/shows a peer his artwork (with or without speech).
- The focal student waves to a peer, who is looking down and does not respond.
- The focal student raises his hand to initiate a "high five" with a peer without severe disabilities.

Non-examples:

- The focal student is talking aloud toward the entire class but the initiation is not clearly directed toward any specific peers.
- The paraprofessional says to the focal student, "Say hi." The focal student looks at the peer support for couple seconds and turns his head away.
- The focal student is walking by a teacher and a group of peers while making a comment not directed toward a specific person, "Oh, I forgot to bring back the permission slip for the field trip.

Peer Interaction: Peers without severe disabilities direct verbal or nonverbal (e.g., gestures, signs) communicative behavior toward focal student. If a peer initiates toward a group of students including the focal student, code as an interaction if the peer's interactive behaviors clearly directed toward or includes the focal student.

Examples:

- A peer says to the focal student, "Hey, let's go!"
- A peer asks a group of students, including the focal student, "Are any of you coming to the dance tonight?"
- A classmate passes a worksheet to the focal student and <u>also</u> says, "Here you go."

Non-examples:

- A peer is talking to the teacher and the focal student is looking or smiling at the peer.
- While distributing worksheets to the entire class, a classmate walks by the focal

student and leaves a worksheet in front of the focal student.
- A peer who sits next to the focal student makes a comment to herself, "I wish I had remembered to bring the permission slip back today."

Proximity to Peer: focal student is sitting or standing beside or across from peer without severe disabilities. No more than two meters separates the focal student and the peer.

Examples:

- A peer is sitting directly next to or across the table from the focal student.
- The focal student and a peer are sitting in desks that are side-by-side.

Non-examples:

- A peer and focal student are sitting back to back at different tables
- While providing instructions to the focal student, the paraprofessional stands in between a peer and the focal student.

Consistent Engagement: The focal student is engaged in or attending to instructional activities and/or tasks assigned by the teacher or the paraprofessional that are consistent or aligned with the content provided to the majority of the class (i.e., identical or appropriately modified from the class curriculum with respect to difficulty, modality, response format, length and/or materials).

Engagement is defined as looking at materials (e.g., textbook, worksheet, overheads) related to ongoing instructional activities, looking at the teacher, writing related to the assigned activity, following teacher instructions/directions, raising hand, or asking questions of the teacher about instructional activities. Explicit teacher instructions (i.e., is the student doing what the teacher asked him/her or the class in general to do?) or observations of other classmates (i.e., is the student engaging in the same general behaviors as his/her classmates?) are sometimes helpful guides in determining what behaviors are expected at a given time if the focal student is receiving the same instructions as the rest of the class.

Note: Consistent academic engagement is the only code that requires the behavior to be exhibited for the entire interval (whole interval recording). All other behaviors are coded if they occurred at any time during an interval (partial interval recording).

Examples:

- Focal student is working with a peer or paraprofessional on an assignment using adapted materials
- Focal student is completing adapted worksheets that are similar to class content
- Focal student is reading books on a lower reading level related to course content
- Focal student is following large-group instructions in a slower pace

- Focal student is listening to the same lecture as the rest of the class (body/head oriented toward teacher)

Non-examples:

- There is no instruction or no expectation for student engagement (e.g., teacher has not yet come to class; students have all completed assignments and teacher does not provide any further directions or instruction)
- Focal student is coloring or completing other activities unrelated to the class theme/unit for the day
- Focal student is working on assignments from other classes
- Focal student is moving around the classroom during instructional activities
- Focal student is looking around the room or staring "off into space"
- Focal student is not paying attention to a teacher lecture (i.e., not looking at the teacher, writing, or writing)
- Focal student is talking to peers when he/she is not supposed to
- Focal student is sleeping.
- Focal student student is not being provided with any instructional materials
- Focal student is waiting for an assignment/activity to begin.

Prompt social interaction: Paraprofessional encourages or suggests a way for the focal student to interact with a peer without severe disabilities, or a peer with the focal student.

Examples:

- Paraprofessional prompts focal student to greet a peer by pointing to the peer pantomiming waving hello
- Paraprofessional suggests to a peer, "Why don't you ask Helen about what she did last night?"
- Paraprofessional points to symbol on AAC device to prompt focal student to answer a question from a peer.

Non-examples:

- Paraprofessional says to focal student, "Why don't you go sit by David?" and focal student goes over and greets David. (Code as prompting proximity, but not as prompting social interaction.)

Reinforce social interaction: Paraprofessional praises the focal student and/or peer for social interactions (verbally or with gestures).

Examples:

- Paraprofessionals says to focal student and peer, "It looks like you two are getting along great!"

- Paraprofessional says to peer, “You’re really doing a great job giving Evan enough time to respond to you using his device.”
- Paraprofessional gives focal student a thumbs up when he greets a peer.

Non-examples:

- Paraprofessional walks by focal student and pats him on the back, but not clearly in response to anything he said or did.

Provide information for social interaction: Paraprofessional provides information to peers that might help peers to better interact with the student. This includes information about how the focal student communicates, interpreting the focal student’s behavior, the focal student’s interests, and possible conversation topics. This differs from a prompt, because the paraprofessional is providing information that will be helpful in the future rather than simply giving directions

Examples:

- Paraprofessional says to peer, “Sometimes when Dylan rocks back and forth, it’s his way of letting you know he is anxious and needs some space.”
- Paraprofessional says to peer, “I know that John doesn’t respond sometimes when you talk to him, but you can tell from the way that he smiles at you that he really enjoys when you talk with him.
- Paraprofessional suggests to peer, “Maybe you could wait a little longer for Deborah to answer you. It takes her a second to find the symbol she’s looking for on her device.

Prompt academic support: Paraprofessional encourages or suggests a way for peer(s) and/or focal student to work together on class activities.

Examples:

- Paraprofessional says to peer, “Maybe after the lecture, you could explain to Sarah in a few sentences what it was about.”
- Paraprofessional suggests to focal student, “Why don’t you ask Justin to program in these words into his iPad so he can use them in class?”
- Paraprofessional suggests to peer, “Maybe if you underline the important words on your paper, Robert can copy them down.”

Reinforce academic support: Paraprofessional praises the peer(s) and/or focal student for the way they are working together on class activities.

Examples:

- Paraprofessional says to focal student and peer, “I really like how well you two are working together!”
- Paraprofessionals says to peer, “That was really smart to think of helping Marty outline his paper so he could go back and fill in the information.”
- Paraprofessional says to focal student, “You and Kevin are working together really well today! I am proud of you.”

Non-examples:

- Paraprofessional walks by peer and winks, but it is not clear if this is related to the peer support arrangement.

Provide information for academic support: Paraprofessional provides information to peers so that they might better support the student. This includes information about strengths and needs related to class participation, accommodations and modifications, and instructional strategies. This differs from a prompt, because the paraprofessional is providing information that will be helpful in the future rather than simply giving directions.

Examples:

- Paraprofessionals says to peer, “Olivia has a really hard time with writing, but she often know some of the answers. When you work on writing assignments, it might work better for her to tell you the answers and then you write them down.”
- Paraprofessional says to peer, “Robert doesn’t like to sit very long. Maybe you can help him find a place to stand at the table to work.”

Prompt proximity: The focal student is not in proximity to a peer. Then a paraprofessional prompts the focal student and peers to be in close proximity (verbally or with gestures). (This may happen simultaneously with a prompt for interaction or support.)

Examples:

- Paraprofessional works with the teacher to change the seating arrangement
- Paraprofessional asks or reminds the student and peer to sit together
- Paraprofessional asks the student and peer to join the same group
- Paraprofessional asks the student and peer to partner for an activity
- Paraprofessional asks student to walk over and say hello to peer (also coded as prompting social interaction)

Non-examples:

- Student and peer join the same group independently.

Check-in: The paraprofessional communicates with peers and/or the focus student to discuss

their role in the peer support arrangement, including if they are comfortable in their roles, or if there would like assistance from the paraprofessional.

Examples:

- Paraprofessional asks peer after peer has been working to focus student on a worksheet, "How have things been going?"
- Paraprofessional says to peer, "You look frustrated. Is there something I can do to help?"
- Peer independently initiates conversation with paraprofessional about an issue.
- Paraprofessional asks focus student, "How have things been going working with Jimmy?"

Non-examples:

- Paraprofessional just says "hello" to peer but does attempt to initiate a conversation about the peer support arrangement.

Whole class: the expectation from the general education teacher is that the whole class should be attending to the same lecture, discussion, movie, or screen.

Small group: the expectation from the general education teacher is that students in the class will work in groups of 3 or more students. The focal student may or may not be participating in a small group (e.g., might be working 1-on-1 with a paraprofessional).

Partners: the expectation from the general education teacher is that students will work in pairs. The focal student may be working with additional peers as an accommodation, or with adult support.

Independent: the expectation from the general education teacher is that students will work independently. The focal student may be working with additional peers as an accommodation, or with adult support.

APPENDIX F

VMPAC Professional Development Package Implementation Checklist

☑ = implemented before feedback
☒ = implemented after feedback
☐ = not implemented

Overview—

The teacher describes the following in detail:

- ☐ Rationale for peer supports arrangements
- ☐ Description of peer support arrangements
- ☐ General goals of peer support arrangements, including increasing interactions with peers, increasing academic engagement, and promoting independence from adult
- Implementation steps associated with peer support arrangements, including the following:
  - ☐ Preparing and planning
  - ☐ Initial meeting with peers
  - ☐ Supporting peer support arrangements through facilitation

Preparing and Planning for Peer Supports—

The teacher distributes a peer support manual to the paraprofessional, highlighting the following materials:

- ☐ Reflecting on classroom activities
- ☐ General ideas for peers supporting classmates
- ☐ Sample peer support plans

The teacher guides the paraprofessional through creating a peer support plan by:

- ☐ Prompting the paraprofessional to begin the peer support plan
- ☐ Providing examples that could be listed on the support plan
- ☐ Providing feedback to the paraprofessional as he/she generates ideas for the plan

Initial Meeting with Peers—

- ☐ The teacher reviews all 10 implementation steps associated with the initial meet with peers
- ☐ The teachers shows the paraprofessional the video model demonstrating the steps

associated with the initial meeting (10 minutes)

Supporting Peer Support Arrangements—

The teacher shares materials on supporting peer support arrangements, highlighting the following in detail:

- Strategies for promoting interaction and academic support
  - ☐ Making sure that peers are close to the focus student
  - ☐ Prompting social interactions
  - ☐ Reinforcing social interactions
  - ☐ Providing information for social interactions
  - ☐ Prompting academic support
  - ☐ Reinforcing academic support
  - ☐ Providing information for academic support
  - ☐ Check-in with peers

The teacher guides the paraprofessional to complete the blank strategy form with examples of strategies specific to the student with a disability. Together they brainstorm at least one example for each of the following:

- ☐ Prompting social interactions
- ☐ Reinforcing social interactions
- ☐ Providing information for social interactions
- ☐ Prompting academic support
- ☐ Reinforcing academic support
- ☐ Providing information for academic support

Video Models

- ☐ The teacher provides the three links to access the web-based video models to the paraprofessional immediately after the initial meeting
- ☐ The teacher reminds the paraprofessional at least once that he or she must watch all three videos by the end of the first week of implementation
- ☐ The teacher asks the paraprofessional to see the three lists (one from each video) that he or she made as part of watching each video model

The Coaching Session

Prior to the coaching session, the teacher observes 30 minutes of class (1) attending at least 30 minutes of class or (2) viewing a video recording of at least 30 minutes of class

- ☐ The teacher thanks the paraprofessional for working to implement peer support arrangements
- ☐ The teacher explains that he or she will be sharing feedback about the observation by highlighting things that are going well and making suggestions to make things even better.
- ☐ The teacher shares one example of good facilitation of peer supports arrangements by the paraprofessional during the observation.
    - ☐ The teacher specifically reinforces what the paraprofessional did well
- ☐ The teacher shares at least example of a time during the observation when the paraprofessional might have missed an opportunity to facilitate, or could have improved facilitation
    - ☐ The teacher provides constructive feedback about what the paraprofessional might do differently next time, directly referencing the strategies for facilitation of interactions and academic support
- ☐ The teacher invites the paraprofessional to talk about his or her concerns related to peer support arrangements
- ☐ The teacher summarizes the coaching session by recapping what the paraprofessional is doing well, how he or she might improve, and any action steps related to discussion of the paraprofessional's concerns
- ☐ The teacher explains that although he or she will not be providing any more formal training support, but that the paraprofessional can always ask for help or support.
- ☐ The teacher encourages the paraprofessional to continue to implement peer supports arrangements, emphasizing the possibility of positive outcomes for the focal student

APPENDIX G

Social Validity Questionnaire for Special Education Teachers

Questions about Professional Development

1. Compared to the way that you usually train your paraprofessionals, how effective was the Video Modeling Plus Abbreviated Coaching (VMPAC) training package? (*Circle one)*

   Much less effective Somewhat less effective About the same Somewhat more effective Much more effective

2. How difficult was it to find time to implement VMPAC? (*Circle one)*

   Not difficult at all A little difficult Somewhat difficult Quite difficult Extremely difficult

3. If asked by an administrator about using VMPAC for district-wide training, how likely would you be to recommend it? (*Circle one)*

   Not at all likely A little likely Somewhat likely Quite likely Extremely likely

4. How likely would you be to use the VMPAC training package with your paraprofessionals in the future? (*Circle one)*

   Not at all likely A little likely Somewhat likely Quite likely Extremely likely

5. What was the best thing about implementing the VMPAC training package?

6. What was the worst thing about implementing the VMPAC training package?

7. If you could change one thing about the VMPAC training package, what would it be?

Social Validity Questionnaire for Special Education Teachers (continued)

Questions about Peer Support Arrangements

1. How would you describe the effectiveness of peer support arrangements for your student? (*Circle one)*

   Completely ineffective *A little effective* *Somewhat effective* *Quite effective* *Extremely effective*

2. How likely are you to encourage your paraprofessional to continue to implement peer support arrangements now that the research project is over? (*Circle one)*

   Not at all likely *A little likely* *Somewhat likely* *Quite likely* *Extremely likely*

3. How likely are you to help other paraprofessionals implement peer support arrangements in the future? (*Circle one)*

   Not at all likely *A little likely* *Somewhat likely* *Quite likely* *Extremely likely*

4. How likely would you be recommend the use of peer support arrangements to other teachers? (*Circle one)*

   Not at all likely *A little likely* *Somewhat likely* *Quite likely* *Extremely likely*

5. Looking back on your experience, what advice do you have for other teachers who are working with paraprofessionals to implement peer support arrangements?

Social Validity Questionnaire for Paraprofessionals

Questions about Professional Development

1. Compared to the training that you typically receive, how effective was the training you received from your supervising teacher to implement peer support (an orientation session, video models, and feedback from your supervising teacher)? (*Circle one)*

   Much less effective Somewhat less effective About the same Somewhat more effective Much more effective

2. How difficult was it to find time to complete the training related to facilitating peer support (e.g., finding time to meet with your supervising teacher, watching videos)? (*Circle one)*

   Not difficult at all A little difficult Somewhat difficult Quite difficult Extremely difficult

3. If asked by an administrator about using similar training for district-wide professional development, how likely would you be to recommend it? (*Circle one)*

   Not at all likely A little likely Somewhat likely Quite likely Extremely likely

4. If your supervising teacher offered a similar voluntary training opportunity in the future, how likely would you be to participate? (*Circle one)*

   Not at all likely A little likely Somewhat likely Quite likely Extremely likely

5. What was the best thing about this training opportunity?

6. What was the worst thing about this training opportunity?

7. If you could change one thing about this training opportunity, what would it be?

Social Validity Questionnaire for Paraprofessionals (continued)

Questions about Peer Support Arrangements

1. How would you describe the effectiveness of peer support arrangements for your student? (*Circle one)*

   Completely ineffective *A little effective* *Somewhat effective* *Quite effective* *Extremely effective*

2. How difficult was it to implement peer support arrangements? (*Circle one)*

   Not difficult at all *A little difficult* *Somewhat difficult* *Quite difficult* *Extremely difficult*

3. How likely are you to facilitate peer support arrangements in the future now that the research project is over? (*Circle one)*

   Not at all likely *A little likely* *Somewhat likely* *Quite likely* *Extremely likely*

4. How likely would you be recommend the use of peer support arrangements to other paraprofessionals? (*Circle one)*

   Not at all likely *A little likely* *Somewhat likely* *Quite likely* *Extremely likely*

5. What are some examples of specific things you saw that told you peer support arrangements were successful?

6. What was the most challenging thing about implementing peer support arrangements?

7. Looking back on your experience, what advice do you have for paraprofessionals who are implementing peer support arrangements for the first time?

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