VOCABULARY ACQUISITION AND BEHAVIOR OUTCOMES FOR STUDENTS WITH EBD: FLASHCARD USAGE AND INSTRUCTIONAL DELIVERY

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Most individuals with emotional and behavioral disorders (EBD) have difficulties in educational and social settings delaying academic and behavioral gains. Peer-mediated interventions (PMIs) have proven effective within both general and special education in academic and behavioral domains. The current study investigated the effect of peer-mediated instruction and SAFMEDS on vocabulary acquisition and behavioral outcomes for two elementary students with EBD. An alternating treatment design was used to evaluate four conditions, peer-mediated SAFMEDS, peer-mediated traditional flashcards, independent SAFMENDS and independent flashcards. Student vocabulary performance improved (increasing corrects and decreasing corrects) across all four conditions and did not distinguish themselves from one another. However, students demonstrated fewer disruptions in peer mediated conditions. A discussion covering the SAFMEDS and peer-mediated conditions immediately precedes directions for future research and implications follow a discussion of findings.

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PREFACE

I wish to express my immense appreciation for some very special people whose guidance and support made this dissertation work possible.

I want to thank my parents, Sid and Lori Shue for their endless support and helping me balance everything these last three years. I would not have survived this whole experience without you. You always believed and supported me, even when I did not believe in myself. I also want to thank my wonder special education cohort, who helped me not only through lunch, but every step of the way. Lastly, I started with table two and would not have finished with table two. Thank you for being my rock(s) throughout the program and google hangouts.

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1.0 INTRODUCTION

The Individuals with Disabilities Education Act (IDEA) defines students with emotional and behavioral disorders (EBD) as students who have an inability to learn that cannot be explained by outside features such as intellectual, sensory or health factors (IDEA, 2004). Students with EBD have difficulty with interpersonal relationships and frequently exhibit inappropriate types of behaviors. The probability of failure among students with EBD is compounding. Youth with EBD have the lowest graduation rate of all students with disabilities (Koller, & Bertel, 2006; Newman, Wagner & Knokey, 2011). Academic difficulties begin at a young age and discrepancies further widen by the time they reach high school (Ryan, Reid, & Epstein, 2004; Sutherland & Snyder, 2007).

Despite staggering failing statistics, most student with EBD receive instruction in the general classroom setting. In Pennsylvania 46% of students with EBD are in the general education classroom at least 80% of the day with or without supports (Annual IDEA Report to Congress, 2013). As these students are being more frequently educated in an inclusive setting, it is becoming increasingly more important to look for interventions that both emphasize academic and behavior remediation. Unfortunately, research on the effects of combined academic and behavioral interventions for students with EBD is lacking. Landrum et al. (2003) argue that students without EBD who are provided academic interventions exhibit similar educational

deficits and behaviors as those with an identified EBD. The recommendation, thus, is to employ effective interventions associated with other populations such as peer-mediated instruction.

Peer-mediated interventions (PMIs) is a type of academic intervention effective with both general and special education populations (Lindauer & Petrie, 1997; Utley & Mortweet, 1997). The utilization of PMIs has successfully been demonstrate in academic, behavioral, and social settings (Ryan et al., 2004**).** PMIs have consistently produced academic gains with many diverse learners (Fuchs & Fuchs, 2005; Flood, Wilder, Flood & Masuda, 2002). The peer tutoring structure promotes highly engaging academic behaviors and the use of peer reinforcement. Peer-mediated instruction provides frequent opportunities to respond and demonstrate understanding while receiving immediate and corrective feedback and praise. Each of these components have been empirically linked with increased academic achievement (Bowman-Perrott et al., 2013; Greenwood et al., 1992; Maheady et al., 1988). Although minimal, the current research on the effects of PMIs for students with EBD is promising. According to Spencer (2006), PMIs may lead to improved academics, social skills, and overall functioning in school, while supporting students with EBD and their peers (Kaya, Blake & Fong, 2015, Maheady, 1998).

PMIs have successful behavioral impacts. While facilitating academic success, behaviors are reduced by encouraging on task behaviors, improving self-esteem through success, and improving their social skills while working with their peers (Kaya, et. al, 2015). Research suggests that improvements in appropriate classroom behaviors and peer interaction contribute to appropriate social competence (Maheady, 1998; Blake et al, 2000; Locke & Fuchs, 1995). Despite a rise in the body of literature showing positive social and interpersonal benefits from the use of peer-mediated interventions (Blake et. al, 2000, Locke & Fuchs, 1995, Franca et al.,

1990) limited studies directly combine behavioral and academic interventions (Rivera et al., 2006, Spencer, 2006).

Delinquent behaviors and deficits in language proficiency often co-occur, yet language deficits are often forgotten or ignored in children with emotional and behavioral disorders (EBD) (Hollo, Wheby & Oliver, 2014). Children who exhibit problem behaviors tend to have minimal language proficiency (Benner, Nelson, & Epstein, 2002). Language development is the foundation of, and unavoidably entangled with, adaptive academic, social, and behavioral performance (Im-Bolter & Cohen, 2007; Toppelberg & Shapiro, 2000). One intervention used to effectively promote language development, semantics, and vocabulary acquisition is Say All Fast a Minute Each Day Shuffled (SAFMEDS).

A technique focusing on language not previously implemented with students with EBD is SAFMEDS (i.e., Say All Fast a Minute Everyday Shuffle; Graf & Auman, 2005). SAFMEDS is an instructional strategy within a precision teaching framework pioneered in the late 1970's developed by Ogden Lindsley, similar to traditional flashcards (Stockwell & Eshelman, 2010). SAFMEDS uses fluency (speed and accuracy) as evidence of learning with one-minute timed daily assessment. SAFMEDS has been shown to be effective in building fluency across a range of subject areas and students, including those with disabilities and those in elementary school (Eshleman, 1985; Korinek and Wolking 1984, Vlope et al. 2011). Traditionally, the focus of SAFMEDS is vocabulary and language acquisition, one of the most predominant problem areas for students with EBD (Griffith, Rogers-Adkinson, & Cusick, 1997; Hinshaw, 1992; Kaiser & Hester, 1997). Future SAFMEDS research, grounded in vocabulary acquisition, will look at both the entangled language development and recognize that behavioral performance plays a large role.

Students with EBD positively benefit from the social and interpersonal interactions during the use of peer-mediated interventions (Blake et. al, 2000, Locke & Fuchs, 1995, Franca et al., 1990). Minimal research has been concluded looking collectively at both behavioral and academic interventions. (Rivera et al., 2006, Spencer, 2006). Integrating SAFMEDS with peer-mediation would provide recurrent opportunities to respond and demonstrate understanding while receiving immediate and corrective feedback and praise. In addition, it would assist in modeling and building appropriate peer relationships in a semi-structured safe environment. Behavioral interventions that incorporate SAFMEDS, peer tutoring, and self-monitoring, contribute to positive educational outcomes in all cultural backgrounds (Kaufman et. al., 2008.) With limited research available looking at a variety of conditions including, SAFMEDS and individuals with EBD, and the arrangement of SAFMEDS combined with peer-mediated interventions, it would be beneficial to assess this structure in future research and add to a limited body of knowledge surrounding EBD, SAFMEDS and peer-mediated instruction and students with disabilities, specifically EBD.

2.0 LITERATURE REVIEW

Students with EBD have an inability to learn that cannot be explained by outside features such as intellectual, sensory or health factors (Individuals with Disabilities Education Act, 20 U.S.C. § 1400 (2004). They have difficulty maintaining interpersonal relationships and often exhibit inappropriate types of behavior and or feelings. By definition, students with EBD, compared to students without behavior problems, tend to display disproportionately high rates of inappropriately behavior and conversely low rates of positive behavior (Landrum, Tankersley & Kaufmann, 2003).

Youth with emotional and behavioral disorders (EBD) have the lowest graduation rate of all students with disabilities. (Koller, & Bertel, 2006). Nationally, only 40% of students with EBD graduate from high school compared to the national average of 76% (Newman, Wagner & Knokey, 2011). In elementary school there is between a one and two grade level discrepancy in the comprehensive academic performance of children with EBD and typical students. This increases to a difference of approximately three grade levels by the time they reach high school (Ryan, Reid, & Epstein, 2004; Sutherland & Snyder, 2007). Gunter and Denny (1998) believe that children with EBD are at high risk of failing to master basic academic skills that are essential to later functioning. Academic difficulties frequently include low or failing grades, which can relate to other negative consequences including increased dropout rates and amplified delinquency (McEvoy & Welker, 2000).

The failure rate among students with EBD can be staggering, yet these numbers are potentially underrepresented. Students with EBD are often under or misidentified. Kauffman (2006) has suggested in most cases, students with EBD are not identified until their problems are severe and long-drawn-out. According to Gage, Gersten, Sugai, and Newman-Goncha, (2013) differences in ratios of those identified with EBD were found across educational contexts (i.e., school-level, district-level, state-level, and nationally). Gage et al. (2013) also found that English learners are disproportionately underrepresented in the EBD category generally especially when compared with students in the Learning Disability category. Educators are often afraid of mislabeling a student with a mental health/behavioral disorder. The 2013 Annual IDEA report to congress identified 6% of students ages 6 to 21 with ED or EBD. Students with EBD are being educated, primarily in the regular education classroom, at least a portion of the day. In Pennsylvania 46% of students with EBD are in the regular education classroom at least 80% of the day with or without supports (2013 Annual IDEA Report to Congress). As students with EBD are increasingly being educated in regular education setting, there is a change looking at more effective academic interventions techniques for children with EBD. Researchers are now placing more emphasis in academic interventions when looking at a behavioral modification in a school setting (Mooney, Epstein, Reid, & Nelson, 2003).

Throughout history, researchers and educators have attempted to educate the EBD population by addressing inappropriate social behaviors (Ryan et al., 2004). Theoretically, by reducing the inappropriate behaviors, a student's academic performance should increase. Therefore, most interventions used with children of EBD have primarily focused on social behavior rather than academic outcomes (Dunlap & Childs, 1996). Recently, there has been a change in philosophy with an emphasis on addressing academic deficiencies in an attempt to

minimize inappropriate behaviors. Unfortunately, research is deficient when emphasizing both academics and behavioral interventions with the EBD population. Researchers acknowledge a lack of studies focusing on reading with students with EBD. Landrum, Tankersley and Kaufmann (2003) make the argument that students involved in academic intervention exhibit some of the same educational and behaviors displayed by those with EBD. Landrum et al. (2003) emphasizes rather than employing a specific intervention for the EBD population, implement an already proven method of intervention that is successful with other populations student, thus making the intervention unique. By focusing on a proven method of intervention such as peer-mediated learning supports both accountability and standards based curriculum while reinforcing EBD student needs. As societal norms promote the inclusion of students with disabilities, it is important to look at intervention strategies that support both the academic and behavioral needs of all students, including those with EBD.

2.1 EFFECTIVE INTERVENTIONS

Peer-mediated interventions have consistently produced academic gains with many different types of learners. This includes students with learning disabilities, behavior disorders, and attention deficit hyperactivity disorder, showing that PMIs may prove effective for a wide range of students (Fuchs & Fuchs, 2005; Flood, Wilder, Flood & Masuda, 2002). Academically, What Works Clearinghouse (2012) found peer-mediated learning approaches have had positive effects on alphabetics with mixed effects on comprehension for beginning readers. Other studies suggest that peer-mediated learning is a promising treatment for increasing social interaction in children, adolescents, and young adults including those with Autism Spectrum Disorder while in

inclusive settings, with positive generalization, maintenance, and social validity outcomes (Watkins, 2015). This is an important distinction in understanding that students with EBD also struggle with applicable social interactions, allowing for students to increase both appropriate social interactions and academic successes.

Peer-mediated learning approaches are based upon the notion that students need frequent opportunities to respond, demonstrate their understanding or skill, and receive immediate corrective feedback, guidance, and praise. Peer-mediated learning has shown to: (1) increase the number of opportunities for students to respond to instruction, (2) increase the amount of time on task, (3) increase the amount of feedback a student receives on their responses, and (4) increase the immediacy of the feedback (Bowman-Perrott et al., 2013). Each of these components have been empirically linked with increased academic achievement for students (Bowman-Perrott et al., 2013; Greenwood et al., 1992; Maheady et al., 1988). Academic interventions can be divided into three categories including: child-mediated interventions, teacher-mediated interventions, and peer-mediated interventions. Peer-mediated intervention have proven effective within both general education (Lindauer & Petrie, 1997; Utley & Mortweet, 1997) and special education. The effectiveness of peer-mediated interventions has been demonstrated in academic, behavioral and social settings (Ryan et al., 2004**).** A wide range of techniques fall under peer-mediated or peer-assisted intervention umbrella as summarized in Table 1, Appendix A. Interventions may include: peer modeling, peer networking strategies, peer tutoring, cross-age tutoring, reverse-role tutoring, class-wide peer tutoring (CWPT), peer-assisted learning strategies (PALS), class wide student tutoring teams (CSTT), reciprocal peer tutoring (RPT), peer counseling, peer assessment and cooperative learning (Ryan et al., 2004).

Ryan et al., (2004) looked at 14 peer-mediated intervention studies and calculated 47 effect sizes on seven articles for nine dependent measures the overall effectiveness was 1.875. Kaya, Blake and Fong (2015) also looked at peer-mediated interventions employed by students with EBD and found that peer-mediated interventions are valuable for improving the overall functioning of schools that serve students with EBD. The benefits of the intervention extend to teachers and typical students, increasing both academics and social skills. Maheady (1998) agreed that research has shown that peer tutoring provided numerous benefits for both the tutor and tutee. Spencer (2006) also concluded after a synthesis of 38 research studies that peer-tutoring has demonstrated to be an effective instructional strategy for students with EBD. In addition, Rivera, Al-Otaiba, and Koorland (2006) found that investigations with EBD and peer-mediated interventions conveyed positive effects of reading. Throughout Rivera et al., (2006) review of six studies, no study directly compared interventions with behavioral supports. Many studies have questioned whether interventions were more effective when combined with behavioral supports.

2.2 BEHAVIORAL IMPACT

Kaya, Blake, and Fong (2015) identified a distinctive attribute of peer-mediated interventions. The characteristic is the prospective value of a single effective intervention simultaneously facilitating academic success, while reducing problem behaviors, encouraging on task behaviors, improving social skills and self-esteem. Studies conducted have found that peer-mediated intervention exerted a controlling effect on the on-task behavior and social interaction of students with EBD. Locke and Fuchs (2015) found a 4.17% mean positive interaction during non-

treatment and a 17.5% positive interaction during treatment. The Locke and Fuchs study supports additional studies, which demonstrate that peer-mediated interventions provide teachers an instructional strategy for improving academic achievement and social functioning (Cochran et. al., 1993; Hogan & Prater, 1993; Scruggs, Masteroprieri, & Ricter, 1985). Despite a rise in the body of literature showing positive social and interpersonal benefits from the use of peer-mediated interventions (Blake et. al, 2000, Locke & Fuchs, 1995, Franca et al., 1990), few studies look directly at the related outcomes of combined behavioral and academic interventions (Rivera et al., 2006, Spencer, 2006).

2.3 PURPOSE AND RESEARCH QUESTIONS

The purpose of this paper is to provide a review and discussion of the current peer-mediated literature related to characteristics of peer-mediated intervention strategies used with school-aged students with EBD. Since Ryan, Reid, and Epstein (2004) have already conducted a review of literature on solely academic achievement, this review examines research that has been conducted with students with EBD using peer-mediated intervention for all academic outcomes, not only achievement testing. In addition, behavioral components of peer-mediated interventions will also be examined. This review strives to address the following questions: (1) what are the characteristics of participants being studied with respect to age, gender, ethnicity and location? (2) assessment of the efficacy of peer-mediated interventions (3) identification of effects of these interventions relative to behavioral outcomes and (4) peer-mediated effects on social skills.

2.4 METHOD

To be included an article had to (a) be published in a peer-review journal; (b) include manipulation of independent variable; (c) include at least one academic measure as a dependent variable; (d) include a discussion of behavioral outcomes; (e) the study includes students labeled EBD; (f) and the study examined an intervention conducted in a school setting. A comprehensive search was conducted for all studies conducted with students with EBD investigating peer mediated interventions and their effects on academic achievement and behavioral outcomes. The following procedures were used to locate articles. Computer-assisted searches for relevant literature were conducted using Educational Resource Information Center (ERIC) and PsycInfo with the following keywords: emotional behavioral disorders, peer-assisted learning strategies, peer-mediated, emotional disturbance, peer-tutoring, PALs, emotional, EBD, ED, peer mediated interventions, behavioral disorders, reciprocal peer tutoring, class-wide peer tutoring, and CWPT. The title of the initial 675 articles was examined. Summary results and abstracts were examined to meet relevant criteria. An ancestral search was also performed by checking the citations from relevant studies to determine if any of the articles cited would qualify for inclusion of this review. Finally, references in prior literature reviews conducted with students with EBD were checked in an attempt to identified relevant articles not previously identified. After applying inclusion, criteria 10 articles were identified in 4 journals.

2.5 RESULTS

2.5.1 Characteristics

The 10 studies identified for this review included 111 participants, 11% females, 74% males, and 15% unreported. The majority of the participants were African American (48%), then Caucasian (19%) and Hispanic (4%). Four studies did not report race making up 29% of participants, these studies accurately follow current research and numbers. The studies were primarily identified in the primary grade levels with only two studies taking place in the secondary level and one crossing both primary and secondary (Appendix B, Table 2). There was a relatively equivalent amount of both private/alternative schools (40%) and public school settings (60%). The content areas addressed included reading (6), math (1), science (2), and writing (1). Studies in primary grades focused mainly on reading and phonics skills 86% with 14% focusing on writing skills. The secondary grades focused on 67% on science and 33% on math. Overall, the majority of the studies were reading focused 70%.

2.5.2 Intervention effectiveness

Looking at four different aspects of peer-mediated learning, (reading, writing, math, science) each demonstrated an effective intervention for individuals with emotional and behavioral disorders. Seven interventions focused on peer tutoring. Three independently found that class-wide peer tutoring was consistently effective, increasing 50% from individual teacher tutoring (Kamps et al. 1999). Bowman-Perrott (2009) study showed similar effectiveness averaging 36% gains in post-tests. Studies using peer-tutoring models all showed an increase in their academic

areas. Falk and Wheby (2001) PALs intervention, demonstrated marked increase in letter-sound identification and blending skills for students participating in both teacher-led and peer tutoring activities. Only one student demonstrated growth from pretest to post-test on segmentation problems. Wheby et al. (2003) showed similar results, all students showed positive trends in correct blending and modest increases in segmentation probes. Students did not show success in sound naming, sight words, or nonsense words. Both studies suggest that phonological skills did not generalize to general reading ability. Other studies Sutherland and Snyder (2007) and Staubitz et al. (2005) showed a marked increase in reading ability especially in fluency. During the intervention phase, each student made progress on words read correctly per minute. When looking at peer tutoring as an effective intervention for Math, Franca and Kerr (1990) showed significant performance increases to both tutor and tutee with an increase rate of 1.08 per minute and the of tutee's from.0 24 to 1.02 per minute and overall increase .78 problems per minute. This peer-tutoring study's primary objective was behavioral management, the writing scores outcome was substantial. The on a writing scale of 10, the average pretest scores was 4.8 and it improved to 8.7. This review is consistent with previous research showing effectiveness of peer tutoring for students with EBD. (Spencer, 2006). Overall, each study showed effective peer-mediated interventions.

2.5.3 Behavioral outcomes

Of the research articles, 80% have demonstrated positive behavioral outcomes, which is consistent with prior EBD research focusing on behavioral outcomes. These positive behavioral outcomes were documented as both on-task behaviors, active engagement and response, decrease in inappropriate target behaviors and increase in positive behaviors. Active student responding is

considered a measure of a students' observable response and is typically incompatible with inappropriate classroom behavior. If a student is actively responding it is be believed they are less likely to disrupt class (Sutherland et al., 2007). The data provided in these studies is statically significant. In classroom one, Bowman-Perrott, Greenwood, and Tapia (2007) showed on-task behavior was 77% but increased to 96% during CWPT. Classroom two during the same study the increase was 89% during teacher led activities and increased to 100% during CWPT. Barton-Arwood, Wehby, Falk (2005) also demonstrated almost 100% engagement during their observations, with reported negative or flat trends of inappropriate behavior for all six students. Franca & Kerr (1990) indicated that peer tutoring was associated with increased positive verbal behaviors and decreased negative verbal behaviors between tutors and tutees. Kamps, Kravits, Stolze, & Swaggart (1999) reported statistically significant gains in improvements for on-task behaviors for target group (78%) compared to the control group (66.2%). Despite an increase in on-task behaviors, aggression and negative verbal behaviors did not decrease for either group but the control group was higher than the target group in the same study. It should be noted that during a teacher survey teachers ratings estimated indicated higher occurrence for all appropriate behaviors by the control-group students. Sutherland and Snyder (2007) also reported an increase between 28% and 19% in each student's active response, but in this study each student's disruptive behavior did decreased.

The two studies, which did not report positive behavioral outcomes, were Wehby, Falk, Barton-Arwood, Lane, and Cooley (2003) and Falk & Wehby (2001). In Webhy et al. (2003), no rate of improvement in inappropriate behavior during reading instruction was documented. In addition, during the Falk and Wehby (2003) study a behavioral contract needed to be implemented due to a student's noncompliance and off-task behaviors interfering with

participation. There was a noted an increased in student performance, likely a result of the behavioral contingency during the tutoring session.

2.5.4 Social skills outcomes

Social skills outcomes were reported in seven out of the ten articles. The social skills outcomes are combinations of self-concept, an individual's set of self-descriptive behaviors, and social interactions between a tutor and tutee (Mintz & Muller, 1977). Questionnaires stated peers were nicer to them or that their peers thought they were smarter as a result of the peer tutoring (Bowman-Perrott, 2009). It was also noted by teachers and administrators that peers who typically do not get along, worked well together during CWPT (Bowman-Perrott, 2009). Franca & Kerr (1990) reported similar findings. Tutors improvement was found in their desirability as co-workers. Statistically there was an increase of 5.7% of positive social interactions for tutors and 7.8% for the tutees demonstrating a decrease in negative social interactions. It was said that tutors in general increased in social acceptance by their classmates more than the tutee after the tutoring program. They were more nominated by their classmates as preferable peers to work with or play with after they performed the role of tutor for one tutee and peers were nicer. They also believed their peers viewed them as smarter (Franca & Kerr, 1990; Bowman-Perrott, Greenwood, Tapia, 2007). Even in other settings these social skills transferred. Recess probes showed significant improvement in levels of positive interactions and the play for the target group (72.8%) and the control group (59.1%) (Kamps, et al, 1999). This concept is strengthened in Bowman-Perrott, et al., (2007) noting student praise in classwork after CWPT occurred, which was not happening prior to CWPT. The only study that openly opposed positive social impact was Wehby et al., (2003) which stated that, "modest gains in reading were not significant enough

to lead to improvement in social behavior" (p.234). The remaining articles supported positive social skills outcomes or did not report social skills separate from behavioral outcomes.

2.6 DISCUSSION

Students with EBD are increasingly being educated in the regular education classroom (2013 Annual IDEA Report to Congress). Even with an inclusionary curriculum, a discrepancy between the academic performance of children with EBD and typical students continues to increase. Research and educator efforts to educate the EBD population by addressing inappropriate social behaviors proves to be inadequate as students with EBD continue to struggle academically. As societal norms push for inclusion it is necessary look to inclusionary interventions, such as peer-mediated interventions, focused on both academics and social behaviors. This review provides a discussion of the literature related those peer-mediated interventions used with school aged students with EBD. The following questions are addressed: (1) what are the characteristics of participants being studied with respect to age, gender, ethnicity and location (2) assessment of the efficacy of peer-mediated interventions (3) identification of effects of these interventions relative to behavioral outcomes and (4) peer-mediated effects on social skills.

Despite a societal focus of inclusion, these studies are not reflective of current EBD placements, which may distort transference of outcomes to other settings. Effective peer-mediated interventions with EBD were found to be inconclusive when looking at the variance and lack of consistency in the research provided. Additionally, the PMI strategies were also inconclusive in directly increasing appropriate behaviors. It is suggested that the intervention

increases on-task behaviors, but is supported with a weak correlation between negative behaviors and the academic intervention. Overall, the peer tutoring structure promotes engaging academic behaviors with the use of peer reinforcement. This suggests improvements in classroom behaviors and peer interaction promoting social competence. With research supporting inconclusive outcomes in academics, behavior, and social competency it is important for future research to replicate current studies to promote a more generalized research base, especially in the area of reading.

2.6.1 Settings and participants

The studies presented are reliable with current gender, race, and socioeconomic status of current EBD trends. There is a disproportionate ratio of males, but according to Cullman, Osborne & Epstein (2004) the majority of students in special education are male, especially in the area of emotional and behavioral disorders. One criticism of this review is that the majority of studies, (60%), area presented are in a self-contained setting, including private schools and self-contained classrooms within a public school setting. This is not representative of the current inclusionary trends. Nationally, it is reported that 43% of students identified with emotional disturbance are included in the regular education setting at least 80% of the day. IDEA (2013) also reported that 81% students categorized as emotionally disturbed are placed in a public school setting for the duration of the day. It also identified that only 18% of student are placed in outside environments, frequently identified as alternative, private or self-contained schools (2013 Annual IDEA Report to Congress). Disproportionately, 40% of these studies were surveyed in a self-contained/alternative/private school. It could be concluded that due to the heavy emotionality and behavioral difficulty which occurs with students in EBD population, it is difficult to control

the environment and outside factors in a public school setting. It could also be perceived that the setting can be more controlled in a self-contained environment. Additionally, with so many occurring in self-contained schools and classrooms, it limited the peer groups available and can reduce motivation and increase frustration in students with EBD. It is necessary that future research, especially with peer-assisted inventions, is more reflective of the current population placements. This is particularly true when identifying and surveying peer-relations.

2.6.2 Characteristics

Generally, researchers do not consistently report participant information. This is especially true when reporting race and ethnicity and is consistent with previous literature (Ryan et. al, 2004, Rivera et al., 2002). Four studies did not report race making up 29% of participants. Despite the missing data, the breakdown of demographics is accurate to current percentiles. The percentage of African American special education students with EBD is higher than in any other racial category (Turnbull, et al., 2007). Interpretations of this statistic can be varied. It might be concluded that African American children are either disproportionately represented in EBD special education due to evaluation and assessment bias, or that EBD is peculiarly an African American problem. Regardless of the interpretation, these studies accurately follow current research and numbers. Studies that reported race did not mention students of mixed ethnicity who according to the 35th Congressional Report to Congress make up the second highest ethnicity next to African Americans when identifying individuals with disabilities.

When looking at gender, the results can conclude that the research is representative of current emotional and behavioral trends in special education. The majority of participants were male (74%) confirming the prior knowledge that a higher incidence of male students are

identified with EBD than females (Buaer & Shea, 1999). There are many theories to why this is the case, but one frequently accepted theory is that males tend to have more externalizing behaviors so they are more easily recognized. Females have more internalizing behaviors so they are more difficult to identify (Callahan, 1994).

In this study, there was a relatively equal representation of both private/alternative schools (40%) and public school settings (60%). The current 2011 statistics represented in the 2013 Congressional Report describe Emotional Disturbance as being represented 43.1% of students being in the regular education classroom setting at least 80% of the day. Overall, it was documented that 82% students identified with EBD are in the regular education classroom at least some point in the day. Only 18% of students are listed as other environments. Given these current statistics, many more students in public school settings should be represented in the research studies. The trend for full inclusion is growing, but perhaps more of these studies were included in self-contained classrooms because teachers believe that individualized instruction and behavior management plans are less developed in regular education classrooms than in self-contained classrooms (Harvey, 1996).

2.6.3 Intervention effectiveness

Academic peer-assisted interventions with students with EBD are limited considering approximately 6.4% of all students classified in special education are identified as having an Emotional Behavioral Disorder (U.S. Department of Education, 2013). This is especially concerning knowing that some researchers advocate that peer tutoring may lead to behavioral improvements in students with disabilities (DuPaul et al., 1998, Franca et al., 1990). Despite the research reports, it is truly difficult to determine the effectiveness of the intervention, due to a

lack of consistency in the research studies provided. Only ten studies were provided and those studies frequently looked at differing components and populations. The secondary grades primarily focused on 67% on science and 33% on math. Overall, the majority of the studies were reading focused 70%, this could be in relation to the Reading First Initiative of the No Child Left Behind Act (NCLB) (2002) which stated that schools must provide reading instruction in the primary grades that has been validated through scientifically based reading research (National Reading Panel 2000). Although all investigations included in this review reported positive effects of academic success in their individual content areas, it is impossible to directly compare the effectiveness of the interventions due to several constraints. The treatments varied across the studies in terms of subjects taught, duration, intensity, interventionist, and specifically the type of peer-mediated intervention. When looking at reading, which composed of 70% of the studies researchers used a variety of measures ranging from words correct per minute, letter-sounds correct per minute, blends per minute, segments correct per minute, comprehension, Woodcock-Johnson III, nonsense words, blending, sound naming, sight words, and segmentation probes to standardize measures. Individually, data all stated that they were effective means for interventions, but only one of the studies reported effective sizes, most studies looked at overlapping data points across phases.

This lack of robust and systematic research hindered a definite conclusion of effectiveness. Duration and class size was a very common limitation when working with learning strategies that requires multiple peer interactions. Short single-case studies limit the longitudinal research, which could generate findings that are more concrete. Especially in those relative to relationships and self-efficacy and the interventions. All studies represented were single-case designs. These cases are designed to be small number cases. This deficiency in

research is consistent with What Works Clearinghouse (WWC) (2011) assessment of peer-assisted learning strategies with learning disabilities. Only five studies across, fluency, comprehension, and math met the standards for effectiveness for students with learning disabilities using a peer-mediated intervention. The outcome showed a level of small effectiveness.

Despite showing, overall positive gains there were two cases in which students did not show success. These were in sound naming, sight words, or nonsense words. Both studies suggest that phonological skills did not generalize to general reading ability. Barton-Arwood, et al., (2005) showed dramatic increases in phonetic word-attack skills, but students' phonological process barely rose about 20th percentile and fluency scores were positive during intervention, but scores were not stable. Findings indicate that the lack-generalized skills of transfer to fluency even with increased intensive instructional time demonstrate slow growth in students with EBD. Falk and Wehby (2001) study further supports that the explicitly taught skill of letter-sound identification and blending skills showed more growth whereas segmenting skills were practiced during the play activities and were more abstract in nature and required the students to make a less explicit connection between letters and sounds. Barton-Arwood et al., (2005) suggest a higher-order reading skills that developmentally follows the acquisition of basic skills.

The results for reading achievement are similar to other studies targeting students with similar achievement and behavioral profiles (Strong et al., 2004, Wehby, Falk et. al., 2003).

2.6.4 Behavioral outcomes

Barton–Arwood et al. (2005) demonstrates, despite having flat trends of inappropriate behavior for all six students and 100% engagement in the majority of observations, the studies did not

clearly support or refute other published reading intervention studies of students with EBD. Limited studies have definitively reported improved engagement with reduced problem behavior in association with reading interventions (Locke & Fuchs, 1995; Yell, 1992). Typically, the only engagement appeared related to the reading intervention. Wehby, Falk el al. (2003) which reported inconclusive results, also supports that study. Despite modest gains in reading, they were not significant enough to lead to improvement in social behavior. It has been suggested that changes in behaviors are a result of the environment including, teacher behaviors and structure, not necessarily the content of the interventions. There have been studies, which have measured achievement and behavioral measures (Cochran, Feng, Carledge, & Hamilton, 1993) and have showed limited effects. The relationship is vague, to which the degree of improved social behavior is related to peer-mediation.

Both the Barton-Arwood et.al (2005) and Wehby, Falk et al. (2003) directly contradict other studies (Kamps, et. al 1999, Sutherland & Snyder 2007, Tournaki & Criscitiello, 2003, Bowman-Perrott, et.al 2007, Franca & Kerr, 1990) which indicates that peer tutoring was associated with increased positive verbal behaviors and decreased negative verbal behaviors between tutors and tutees. Theses finding give empirical support to previous anecdotal reports that participants in peer tutoring have improved their attitudes towards peers (Dineen et al., 1977; Jenkins & Jenkin, 1981; Maher, 1984). Many of these studies calculated behavior primarily in terms of on-task behavior and engagement. Active student responding is incompatible with inappropriate behavior. If a student is responding, they are less likely to disrupt class. Sutherland & Snyder (2007) exemplifies this point when increases of disruptive behavior correlated with days with lower active responses.

Overall, the literature included in this review suggests that PMI strategies are inconclusive to directly increasing appropriate behaviors. It is suggested that intervention increases on-task behaviors therefore limiting off-task inappropriate behaviors, but there is a weak correlation between negative behaviors and the academic intervention.

2.6.5 Social skills outcomes

In almost every study, both students and teachers endorsed the benefits and utility of peer-mediated interventions. Social competence has been broadly defined as the ability to perform adequately in social situations as judged by teachers, parents, peers, and others (Kamps et. al., 1999). This investigation of literature demonstrated improvements in several critical classroom behaviors that contribute to social competence including on-task behaviors, positive peer interactions, and decreases in aggression and disruptions. The peer tutoring structure promotes highly engaging academic behaviors and the use of peer reinforcement. The findings suggest that improvements in appropriate classroom behaviors and peer interaction contribute to social competence. This is supported by previous studies including: Maheady, (1998); Blake et al, (2000); Locke & Fuchs (1995). Like in the behavioral outcomes, Barton-Arwood et. al., (2005) argues that despite having almost 100% student engagement, the impact of intervention does not necessarily affect the social behaviors for students with EBD. Overall, the findings were consistent with prior research that have shown peer-mediated interventions consistently produce positive social skills.

2.6.6 Future research directions

The present review provides some support for peer-mediated strategies however; there are limitations of the research designs including the reviewed literature that impeded generalizability of findings. Single-subjects designs were most frequently represented using minimally complicated and not clearly defined collection protocol. Without replication of research, their contributions should be interpreted with caution. Most of the inventions were implemented over a short span of time, limiting the overall impact. This may be particularly significant because of the decline of rates after some of intervention concluded. In addition, there is a limitation on the relations of direct observation measures to determine change in social behavior. One key replication is that more research should be conduct in public school settings. According to the data, increasingly students with EBD are being educated in the regular education setting and this is not represented in the current research. The lack of generalization measure in reading is concerning. More replicated research needs to occur in individual area of language such as comprehension, vocab and fluency. Additionally, for research the implications the need to provide detailed descriptions of students in the sample. There are many types of peer-mediated techniques that have yet to be studied with some populations that could prove to be effective methods of instruction especially in the area of language.

A technique focusing on language not previously implemented with students with EBD is SAFMEDS (i.e., Say All Fast a Minute Everyday Shuffle; Graf & Auman, 2005). SAFMEDS is an instructional strategy within a precision teaching framework pioneered in the late 1970's developed by Ogden Lindsley (Calkin, 2003; Graf & Auman, 2005; Potts, Eshleman & Cooper, 1993). SAFMEDS involves the systematic practice of flash cards, normally with vocabulary terms, to fluent levels of behavior (Graf & Auman, 2005). SAFMEDS is used to effectively

promote vocabulary fluency in a similar fashion to traditional flashcards. Research suggests that students routinely use flashcards as a way to repeatedly practice an academic skill (Golding et al. 2012; Kornell and Bjork 2008). However, with SAFMEDS, unlike traditional flashcards, speed and accuracy are taken into account with one-minute timed daily assessments. Experimental literature has shown that SAFMEDS has a comprehensive range of applicability (Kubina et. al., 2015). Quigley (2014) indicates SAFMEDS can increase fluent performance with varied content including: math facts, reading fluency, and positive self-statement across various populations (elementary education, secondary education, university and geriatric).

Traditionally, the focus of SAFMEDS is vocabulary and language acquisition. Although students with EBD struggle in all academic areas, reading and language seem to be the most prevalent problem areas (Griffith, Rogers-Adkinson, & Cusick, 1997; Hinshaw, 1992; Kaiser & Hester, 1997). Language development is the foundation of, and unavoidably entangled with, adaptive academic, social, and behavioral performance (Im-Bolter & Cohen, 2007; Toppelberg & Shapiro, 2000). Children who exhibit problem behaviors tend to have minimal language proficiency, and children with minimal language proficiency tend to exhibit problem behavior (Benner, Nelson, & Epstein, 2002). Hollo, Wehby and Oliver (2014) have found marginal language proficiency and delinquent behavior often co-occur, yet language deficits interventions are likely to be ignored in children with EBD. Future SAFMEDS research, grounded in vocabulary acquisition, will look at both the entangled language development and recognize that behavioral performance plays a large role. Idyllically, academic deficits will be minimized and appropriate behaviors increased.

Literature shows positive social and interpersonal benefits for students with EBD from the use of peer-mediated interventions (Blake et. al, 2000, Locke & Fuchs, 1995, Franca et al.,

1990). In spite of the research, minimal studies look specifically at the related outcomes of combined behavioral and academic interventions (Rivera et al., 2006, Spencer, 2006). By incorporating SAFMEDS and peer-mediated instruction, the capacity to seamlessly integrate both behavioral and academic interventions exists. By utilizing a combined SAFMEDS and peer-mediated instruction, appropriate behaviors will be modeled in a semi-structured environment while reinforcing a structured academic intervention. Kaufman et al. (2008) notes that behavioral interventions which incorporate SAFMEDS, peer tutoring, and self-monitoring, contribute to positive educational outcomes from all cultural backgrounds. This structure would be ideal for individuals with EBD who have both behavioral and academic challenges.

2.7 CONCLUSIONS

This investigation supports previous work advocating for peer-mediated interventions for improving academic skills. Additionally, this supports anecdotal claims that peer tutoring can enhance behaviors and social skills. Unresolved questions are raised concerning the effects of the corresponding intervention and social skills and behavioral outcomes. These questions should be addressed in both short-term as well as long-term investigations. This review shows promise for students with EBD and their abilities to increase educational gains while building social and behavioral skills using an effective research based intervention.

3.0 PURPOSE AND RESEARCH QUESTIONS

The purpose of this study was to examine the effects of instructional delivery (peer mediated (PM) vs. individually mediated (IM) on vocabulary practice (SAFMEDS vs. traditional flash card usage) for students with emotional and behavioral disabilities. The researcher examined the following questions:

1. Under which condition (PM-SAFMEDS, PM- Flash Cards, IM-SAFMEDS, IM-Flash Cards) did participants display more correct and fewer incorrect vocabulary words?
2. Under which condition did students demonstrate fewer disruptive behaviors?
3. What did participants report about each of conditions (PM-SAFMEDS, PM- Flash Cards, IM-SAFMEDS, IM-Flash Cards) at the conclusion of the study?

4.0 METHOD

4.1 PARTICIPANTS AND SETTING

Two Caucasian second-grade males, Andrew and Bill, aged eight and seven respectively, participated in the current study. Following university and school approval, parents provided parental consent and the individual students agreed to participate. Andrew maintains an Autism diagnosis, an Individualized Education Plan, and has a Positive Behavior Support Plan for documented behavioral difficulties. Bill has a dual diagnosis of Autism and Emotional Disturbance. He also receives behavioral support from a Positive Behavior Support Plan. Both students receive services in an emotional support as well as a general education classroom. Participants read and comprehend at grade level and maintain an average to above average IQ score. The intervention took place twice a day (once in the am/once in the pm) in the therapeutic emotional support (TES) classroom within a public elementary school. All intervention interactions occurred at a small kidney table among the other center-based stations.

4.2 MATERIALS AND EQUIPMENT

The experimenter chose 150 unique terms from the students' 2nd grade reading, science, and social studies curriculum (Appendix D). Following the vocabulary screening (see Procedures

below), the experimenter divided 120 words and definitions into four groups of 30 (Appendix D). Terms were balanced by starting letter and number of syllables in each term. Once divided, each term was typed on one of four colored 3x5 flashcards (i.e., red, blue, yellow, green) and laminated. Each flashcard had the term on one side and the matching definition on the other. Examples appear in Appendix C. Each condition had a laminated procedural prompt card (Appendix E) and data collection sheet (Appendix F) in the corresponding color (red, yellow, green, blue). Additional materials included dry erase markers, timers, and a video camera.

4.3 DEPENDENT VARIABLE

The measurement of two dependent variables took place during the study: correct and incorrect definitions identified per 30 seconds. Students were presented flash cards with the definition facing them and asked to provide the correct vocabulary term verbally that meet the presented definition. A correct verbal response matched the term located on the back of the flash card presented. An incorrect verbal response included any words other than the one on the back of the card presented. When the student asked to "pass" the response counted as neither a correct nor an incorrect.

The experimenter also collected the frequency of call-outs during each six-minute practice session. Following review of video recordings from the first two practice sessions, the experimenter determined calling out without permission the most frequent disruptive behavior. A call out was defined as speaking to another individual, staff or student without permission and not involved in the intervention. Speaking to the peer assigned to peer-mediated conditions did not constitute a call out.

4.4 INDEPENDENT VARIABLE

The combination of two types of instruction (i.e., peer and self-mediated) with two types of flash card practice (i.e., SAFMEDS and flash card study) created four conditions. Condition Red contained peer mediated instruction with SAFMEDS. Condition Yellow had peer mediated instruction with independent flash card study. Condition Green had students working independently using SAFMEDS. Condition Blue had the students working alone using independent flash card study.

4.4.1 Condition Red: Peer mediated with SAFMEDS

At the beginning of the condition, the participant and peer were given the red deck and red prompt card (Appendix E) and were asked by the experimenter to follow the steps noted on the card. The researcher then read over and reviewed each step with the students. The participant then set the countdown timer for 6 minutes and pressed start. The peer shuffled the red deck and set another timer for 30 seconds. Before starting, the peer reminded the participant to say each term as fast as they could or to state pass. After saying go, the peer showed each card with the definition facing the peer. The participant quickly stated the term associated with definition or may pass that term to the next without penalty. Passed cards went to the back of the deck. The peer made two piles one with correct responses and the other with incorrect responses. After 30 seconds ended, the peer said "stop," counted the piles, and provided feedback (i.e., the number of corrects and incorrects). The participant then recorded the number correct and incorrect on the 'cold side' of the self-monitoring data collection sheet (Appendix F). The peer and participant

then reversed roles and repeated the above steps with the peer stating the terms and the participant holding the cards.

After the cold sprints were completed, the peer set the timer for three minutes. First, the peer showed each card definition facing the participant. The participant stated the term. When the term was correct, the peer was shown the next card. If incorrect, the peer stated the term and had the participant repeat the term. When the two students completed one turn through the deck, they reversed roles and repeat the process. This continued until three minutes elapsed. Finally, the participant and peer conducted a 'hot sprint', which followed the exact steps as the 'cold sprint' above. The participant sprinted first, followed by the peer. Both recorded scores on the 'hot' side of the self-monitoring data sheet. After both students completed the hot sprint they notified the researcher. Note: If the six-minute timer went off prior to the students completing that day's condition, the students immediately ended, cleaned up and returned to their class.

4.4.2 Condition Green: Individual with SAFMEDS

At the beginning of the condition, the participants were given a green deck and green prompt card (Appendix E) and were asked by the experimenter to follow the steps noted on the card. The experimenter then reviewed and read each step to the participants. The participants set the countdown timer for 6 minutes and pressed start. The participant then shuffled the green deck and set another timer for 30 seconds. After starting the timer, the participant faced the definition of each card to themselves and said the term as fast as possible. The participant also could pass terms without penalty placing the card in the back of the deck. The participant made two piles one with correct responses and the other with incorrect responses. Once 30 seconds ended, the

participant recorded the number correct and incorrect on the 'cold side' of the self-monitoring data collection sheet (Appendix F).

After the cold sprint, the participant set a timer for four minutes. The participant then looked at each card and stated the term based on the definition. The participant immediately checked their answer. This process continued for each card in the deck. Once the deck was complete, the student reshuffled and continued this process until the four-minute timer ended. Finally, the participant conducted a 'hot sprint', which followed the exact steps as the 'cold sprint' above. The participant recorded their score on the 'hot' side of the self-monitoring data sheet. After they completed the 'hot sprint', they notified the researcher. Note: If the six-minute timer went off prior to the student completing that day's condition, the student immediately ended, cleaned up, and returned to class.

4.4.3 Condition Yellow: Peer mediated with flash card study

At the beginning of the condition, the participant and peer were given the yellow deck and yellow prompt card (Appendix E) and were asked by the experimenter to follow the steps noted on the card. The experimenter then read the prompt card to the students. The students were then instructed to first read the prompt card then to set the timer for six minutes. The students then picked up the deck and shuffled the cards. Following the shuffling of cards the student pairs reviewed each flashcard aloud reading front and back of the cards. When the timer sounded the students placed the cards in the middle of the table, notified the experimenter, and returned to class.

4.4.4 Condition Blue: Individual with flash card study

At the beginning of the condition, the participant were given the blue deck and blue prompt card (Appendix E) and were asked by the experimenter to follow the steps noted on the card. The experimenter read the prompt on the prompt card to the student. Then participant was instructed to first read the prompt card and to set the timer for six minutes. The participant then picked up the deck and shuffled the cards. Following the shuffling of cards, the participant reviewed each flashcard front and back. When the timer sounded, the participant placed the cards in the middle of the table, notified the experimenter, and returned to class.

4.5 EXPERIMENTAL DESIGN AND DATA ANALYSIS

The experimental design was an alternating treatment design (Kennedy, 2005). The alternating treatments designs allowed for the examination of the four conditions in rapid succession. Students experienced each of the four conditions (A, B, C, D) nine times in a counterbalanced format over 20-26 school days across approximately 42 calendar days. Sessions occurred twice each day (AM and PM) when possible. The counterbalancing of conditions mitigated possible sequence effects and paper materials matched in color, providing a clear condition distinction for participants. Terms did not overlap between conditions and practice was limited to twice a day (AM and PM) to limit multiple treatment interference and fatigue. A visual analysis of the graphed data, stratification or response differentiation determined the present or absence of an experimental effect.

Segments of the Standard Celeration Charts (SCC) display the vocabulary and disruptive behavior data for both participants. SCCs place behavior in real time, depict learning as a straight line which allows for the calculation of celeration, shows proportional behavior change, and normalizes variability (Kostewicz & Kubina, 2011; Kubina & Yurich, 2012; Lindsley, 2005). SCC uses a distinct set of symbols, standardizes all learning patterns, and reduces decision-making errors.

Analysis of the vocabulary and disruptive data occurred via three measures (level, celeration, and the improvement index) and two measures (level and celeration), respectively. The mean or median rate of responding (i.e., average) within a condition represents level (Kennedy, 2005). The change in behavior over time divided by times refers to the celeration (Johnson & Pennypacker, 2009). The improvement index (I.I.), or a quantification of progress, compares two celerations within the same condition (Pennypacker, Heckler, & Pennypacker, 1977; Pennypacker, Koeing, & Lindsley, 1972; Pennypacker, Koeing, Seaver, 1974). To calculate I.I., two celerations within the same condition *sharing the same sign*, divide the larger by the smaller. Multiply the values when *the signs differ*. The sign applied to the quotient or product results from whether progress has improved (x) or deteriorated (÷). For example, a x4 celeration for corrects and a ÷4 for incorrects results in a x16 I.I. (4x4 = 4: use an X due to the improving condition). On the other hand, a x3 for corrects and x9 for incorrects equals a ÷3 I.I. (9÷3 = 2 with a ÷ symbol indicating a deteriorating condition).

4.6 PROCEDURES

4.6.1 Screening

Prior to the intervention start, the experimenter screened each participating student on all 150 vocabulary words (Appendix D) The investigator provided the untimed, oral assessment, over a period of 3 days, assessing 50 vocabulary words each day to each participant. The experimenter provided no feedback or error correction. Any words that defined correctly were removed from that student's possible word stack. Missed terms by each individual student were used to create the four 30-term groups (Appendix D).

4.6.2 Training day

Prior to the formal start of conditions, students were instructed for approximately 15 minutes on each of the four conditions for a total of one hour across two training days. The researcher explained and modeled the procedures for each of the colored decks. Words and definitions used during training did not appear in experimental conditions. Students had an opportunity to practice each step of the procedure for the condition. The experimenter provided feedback on the performance of the steps as the student follows the prompt card. The students were also instructed to work as quickly and quietly as possible. The experimenter repeated the training process once for each of the conditions during the training day.

4.6.3 Intervention

Two conditions occurred daily, once in the AM and once in the PM, in accordance with the school schedule. Each of the four conditions (Red, Yellow, Green, and Blue) occurred approximately once every two days. Just prior to each condition, the participating student was assessed in a 30-second timed assessment conducted by the experimenter. The specific deck color assessed matched the upcoming condition. The researcher shuffled the cards and set the timer for 30 seconds. The researcher instructed the students to say the term that is associated with the presented definition as quickly as possible. If the student did not know the term they may say pass without penalty and the term was placed to the back of the deck. The researcher placed correct terms in one pile and incorrect terms another pile. After 30 seconds elapsed, the experimenter noted corrects and incorrects and thanked them for their hard work. The experimenter then returned the colored deck and matching prompt card to the participants. The experimenter read each condition's prompts prior to that session's implementation. Students either worked alone (conditions green and blue) or with a peer (conditions red and yellow) following the steps. If students dropped below 95% of steps completed, the experimenter conducted another training on that condition. The process continued until student completed nine practice sessions for each condition and one additional probe. Each student completed participation in the study following the final probe.

4.6.4 Interobserver agreement

A behavioral special consultant (BSC) trained on the data collection procedures within the study re-watched 25% of the videos for each student. The observer scored probes and number of call

outs during each practice condition. The investigator's data sheet totals were compared to the BSC data sheet. IOA was calculated by dividing larger number of observed events (i.e., corrects, incorrects, and total disruptions) by the smaller number and multiplying by 100 to get a total agreement scores for each observed measure (Kennedy, 2005). The mean of the IOA across 18 sets was 87%.

4.6.5 Treatment integrity

Forty percent of all intervention sessions were scored for the accuracy of implementation of the intervention. An integrity checklist (Appendix H) was used to assess the extent to which the students correctly implemented each of the intervention procedures. Overall, treatment integrity was conducted with 74% accuracy. When broken down by condition the integrity varied tremendously ranging from 100% accuracy to 65%. Yellow/peer traditional integrity was 100%, followed by blue/independent traditional with 97%, green/independent SAFMEDs with 69% and lastly red/peer SAFMEDs with 65% accuracy, Treatment integrity was measured as the number of procedures correctly completed for the session, divided by the total number of procedures for the session, and then multiplied by 100%.

4.6.6 Social validity

Social validity was measured using two surveys: one for the general education teacher and one for each participating student (Appendix G). The teacher survey assessed teacher perception of student gains across 11 questions. The student survey contained Social validity refers to whether the proposed intervention and the desired replacement behavior represent socially accepted

practices. Attached Documents (Appendix G) shows both the teacher and student evaluation form that was developed and used as a satisfaction survey for both the general education teacher and participants. This survey can help lead discussions to determine if the intervention was socially valid. The form contains important goals and tasks involved in the intervention. It also evaluates if the intervention fits the designated population, elementary age students with emotional and behavioral disorder. In addition, it evaluates if the teacher believes that the intervention is effective in increasing vocabulary acquisition and if the skills are being generalized to other subjects. It will assess if there are any behavioral changes during the intervention sessions.

5.0 RESULTS

5.1 VOCABULARY PROBE PERFORMANCE

Figure 1 illustrates Andrew's and Bill's correct (dots) and incorrect (x's) responses during vocabulary probes during each of the corresponding conditions: Individual Traditional, Individual SAFMEDS, Peer Traditional, Peer SAFMEDS. All data appear on aspects of the Standard Celeration Chart. Each graph has a ratio-scaled vertical axis referring to a count per 30 seconds and a linear-scaled horizontal axis corresponding to calendar days. Celeration lines created using linear regression lie on specific data paths for correct (solid lines) and incorrect terms (dashed lines).

5.1.1 Andrew

Andrew had almost equal correct and incorrect levels represented by median scores across all four conditions and in each case had a higher incorrect level (Table 3). Andrew also demonstrated accelerating corrects and decelerating incorrects in each instance except during Peer SAFMEDS (Figure 1; Table 3). Both corrects and incorrects accelerated during Peer SAFMEDS. Differences emerged when examining the Improvement Index (I. I.): a measure of progress. Andrew showed the greatest I.I. scores within traditional flash card review conditions

(Individual and Peer; Table 3). Although, he did display improving progress in all four conditions.

Table 1. Andrew's Probe Performance

Condition	*Correct Level*	*Correct Celeration*	*Incorrect Level*	*Incorrect Celeration*	*I. I.*
Ind. Trad.	1	X1.48	2	÷1.05	X1.55
Ind. SAFMEDS	1	X1.10	2	÷1.05	X1.16
Peer Trad.	1	X1.37	2.5	÷1.11	X1.52
Peer SAFMEDS	1	X1.49	2.5	X1.08	X1.38

Figure 1. Participants' Vocabulary Probes

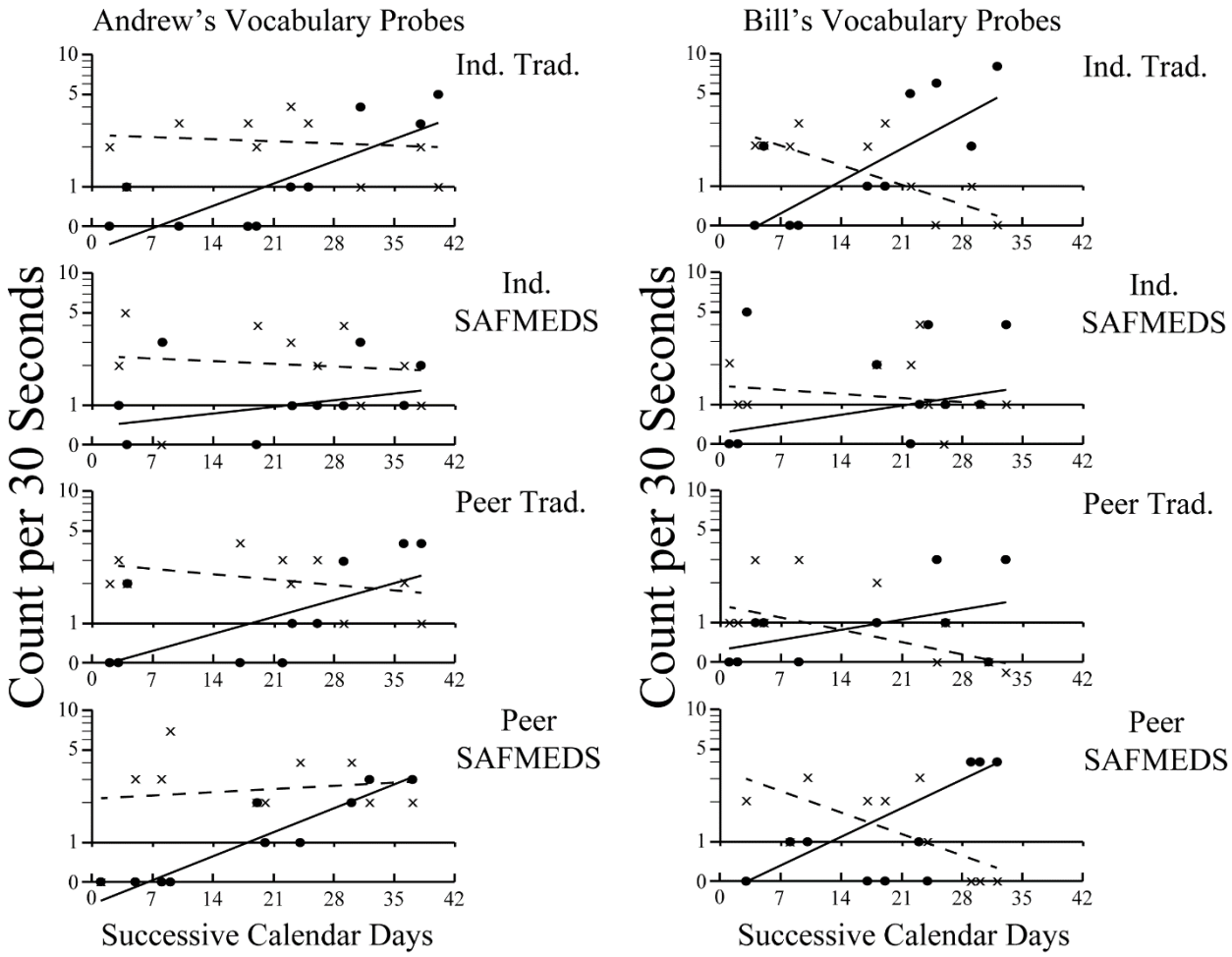

Figure 1. Participants' Vocabulary Probes

Table 2. Bill's Probe Performance

Condition	*Correct Level*	*Correct Celeration*	*Incorrect Level*	*Incorrect Celeration*	*I. I.*
Ind. Trad.	1.5	X1.76	2	÷1.42	X2.50
Ind. SAFMEDS	1	X1.14	1	÷1.05	X1.20
Peer Trad.	1	X1.23	1	÷1.26	X1.55
Peer SAFMEDS	1	X1.55	2	÷1.40	X2.17

5.1.2 Bill

Bill maintained either the same level or more incorrects as compared to corrects during the four conditions (Table 4). Incorrects decelerated and corrects accelerated resulting in improving progress scores (i.e., I.I.) in each condition. The greatest improvements to progress occurred during Individual Traditional (150%) and Peer SAFMEDS (117%).

5.1.3 Summary of vocabulary probe performance

Correct and incorrect level occurred between 1 and 2 for both students and in all conditions. Andrew and Bill made the most progress during the Individual Traditional condition but showed progress across all four conditions.

5.2 DISRUPTIVE BEHAVIOR

Figure 2 illustrates Andrew's and Bill's instances of callouts (x's) during each six-minute practice condition. All data appear on aspects of the Standard Celeration Chart. Each graph has a

ratio-scaled vertical axis referring to a count per six minutes and a linear-scaled horizontal axis corresponding to calendar days. Celeration lines (solid) and values created using linear regression lie on specific data paths for callouts per condition with the dashed lines representing level.

5.2.1 Andrew

Andrew had a varying level of callouts per condition ranging from one (Peer Traditional) to five (Individual SAFMEDS; Figure 2). Andrew demonstrated accelerating callouts for three of four conditions increasing by 13% to 25% across the study. His decelerating measure of ÷1.35 during Peer SAFMENDS represented a 26% reduction in callouts (Figure 2).

Figure 2. Participants' Callouts

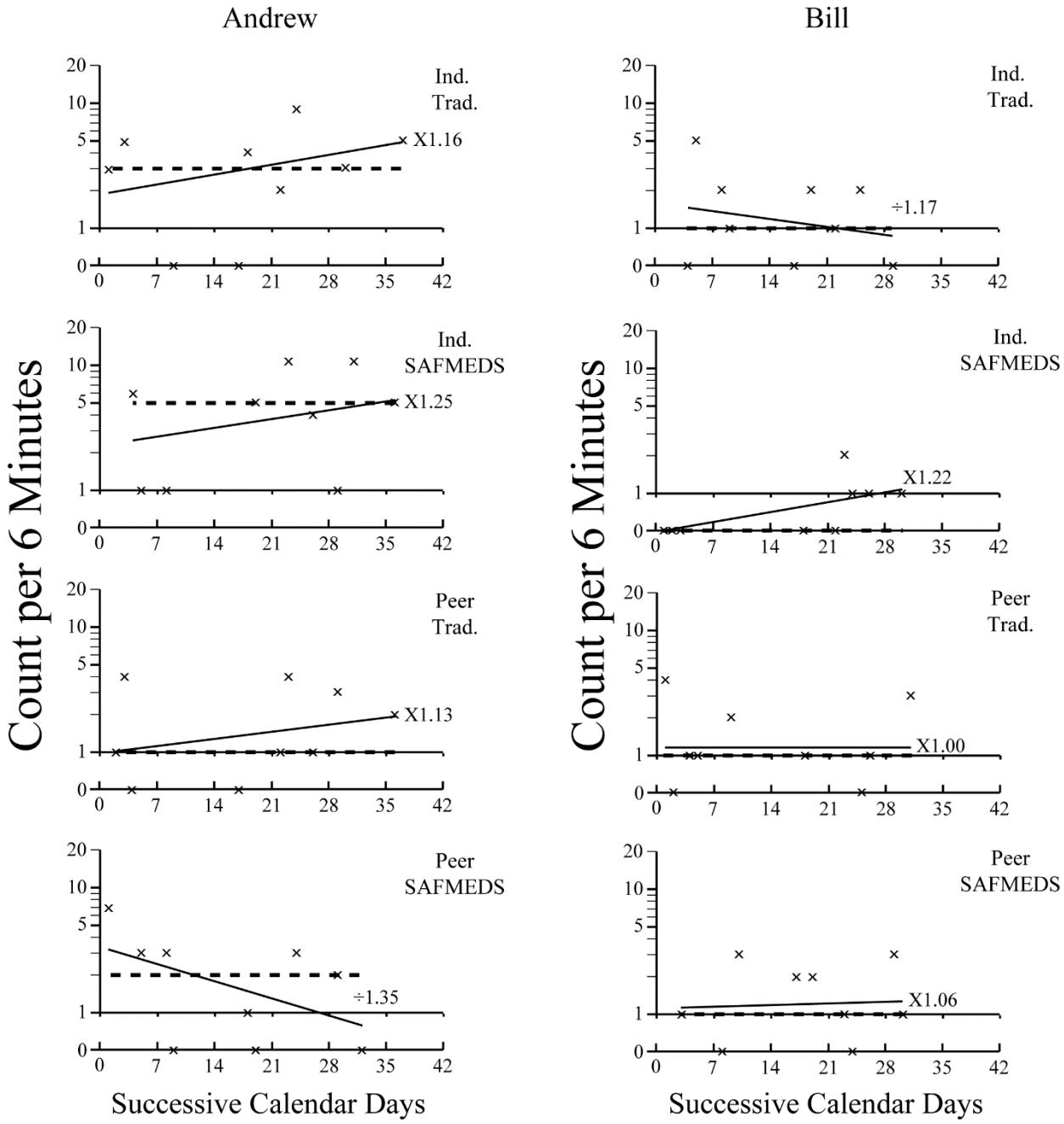

Figure 2. Participants' Callouts

5.2.2 Bill

Unlike Andrew, Bill's level of callouts per condition remained relatively the same at zero (Individual SAFMEDS) or one (Figure 2). Bill did show accelerating callouts during both SAFMEDS conditions increasing by 6% (Peer) and 22% (Individual) weekly. Callouts either decelerated (Individual) or remained the same (Peer) when working with a Traditional flashcard condition.

5.2.3 Disruptive behavior summary

Unlike the vocabulary probe measures, Andrew and Bill's disruptive behavior (i.e., callouts) did not align. Andrew made more callouts than Bill across all conditions. Bill and Andrew also tended to display the opposite behavior during each condition: a decelerating value when the other student showed an acceleration and vice versa. Only during the Individual SAFMEDS Condition did both students show accelerating callouts.

5.3 SOCIAL VALIDITY

At the end of the study, the classroom teacher completed the survey of teacher satisfaction with 5-point rating scale questions. She strongly agreed that peer interventions were helpful for both participants and peers to become more academically competent in vocabulary acquisition. She also strongly agreed that peer mediated interventions and SAFMEDS would be a good fit for her classroom. She agreed that peer interventions were helpful in improving positive behaviors and

social interactions with participants. She was undecided/neutral when looking at decreasing negative interactions with participants. The teacher stated, “It was a positive experience for Andrew. When he wanted to participate he would work hard before the intervention” She did not find the intervention disruptive to classroom activities.

Upon completion, participating students were provided fourteen questions (Appendix G). Both students stated they would like to participate in peer interventions again and would work with their partners in the future. Both students also liked SAFMEDs with a partner but were mixed whether they learned better with a partner rather than independently.

In the open-ended questions, both students stated they liked the SAFMEDs best but did not specify why. The reasons why they liked the peer activities varied from working with kids to learning words before they learned the words in class. Both students provided suggestions regarding the peer-mediated aspect of the intervention. One suggestion was to add additional color-coded cards in other areas and the other was to change the time of the intervention to closer to the end of the day. Overall, they felt positive about helping others and participating in peer-mediated activities in the future.

6.0 DISCUSSION

Students with emotional and behavior difficulties often struggle both academically and behaviorally (IDEA, 2004). Despite the intertwined difficulties with behavior, relationships, and academics, minimal research has considered interventions targeting both academic and behavior outcomes (Rivera et al., 2006, Spencer, 2006). However prior research has found that students with EBD positively benefited from the social and interpersonal interactions during the use of peer-mediated interventions (Blake et. al, 2000, Locke & Fuchs, 1995, Franca et al., 1990). Despite a rise in the body of literature showing positive social and interpersonal benefits from the use of peer-mediated interventions (Blake et. al, 2000, Locke & Fuchs, 1995, Franca et al., 1990) limited studies directly combined behavioral and academic interventions (Rivera et al., 2006, Spencer, 2006). The current research examined the varied effects of an effective intervention (i.e., SAFMEDS) and the insertion of working with peers on the vocabulary performance and disruptive behavior of students with Emotional and Behavioral Disorders.

The data from the current study report mixed results. Student vocabulary performance improved (i.e., increasing corrects and decreasing incorrects) across all four conditions. The results add to the SAFMEDS literature base as data from previous studies report similar improvements. SAFMEDS has shown to be effective in building fluency across a range of subject areas and students, including those with disabilities and those in elementary school (Eshleman, 1985; Korinek and Wolking 1984, Vlope et al. 2011). Student SAFMEDS

vocabulary performance, however, did not distinguish itself from the effects of traditional flashcard practice due in part to multiple reasons.

SAFMEDS stands for Say All Fast, Minute Each Day, Shuffled (Graf & Auman, 2005). Taking Lindsley's (1996), Eshleman's (2000), and Graf and Auman's (2005) procedures together, a basic SAFMEDS procedure includes students engaging in SAFMEDS practice daily. Kim, Carr, and Templeton (2001) and Kubina, Ward, and Mozzoni. (2000) both employed a supplemental SAFMEDS procedure that included multiple daily timings. The current study followed an alternating treatments design to compare performance across multiple experimental conditions (Kennedy, 2005). Ideally, students in the current study experienced each of the four conditions and average of once every other day. In reality, up to 11 days elapsed between practices sessions due to a variety of reasons (e,g., weekends, absences, random counterbalancing).The lack of consistent practice may have affected the validity of the SAFMEDS intervention and affected student outcomes.

Quigley (2014) suggest that in the purest SAFMEDS procedure students should time for one minute for both probes and practice. Most SAFMEDS research reports using one-minute for practice and probes (Quigley). The experimenter chose instead to limit probes and practice for all SAFMEDS conditions to 30 seconds increments to prevent exhaustion, minimize frustration, and allow for maximum practice opportunities within six-minute practice sessions. While time of practice may vary for SAFMEDS practice (Quigley), a one-minute practice may hold benefits shorter timings may not. Increasing practice and probe times may have allowed participating students to better learn and display vocabulary acquisition.

Finally, SAFMEDS follows a very specific set of steps unlike traditional flash card practice (Lindsley, 1996). Peer-mediated SAFMEDS procedures require students to follow 18-

22 steps (Lindsley, 1996; Eshleman, 2000; and Graf & Auman, 2005). To address the intricate nature of the intervention, the experimenter provided training before the study, a review of steps before each practice, and a visual checklist. Regardless, students completed SAFMEDS steps with approximately 70% procedural fidelity prompting additional trainings. Noted procedural integrity difficulties occur when working with SAFMEDS and very few reporting following traditional SAFMEDS procedures (Quigley, 2014). In addition, many of the articles could not be ascertained due to an insufficient description of the procedure, or with procedures described within the general framework but either altered one or more basic components of the procedure. On the other hand, both students complete the traditional flash card review with much higher procedural fidelity suggesting training effectiveness and/or prior knowledge of intervention steps. Lack of procedural integrity combined with other noted differences may have stunted potential gains

Unlike vocabulary results, disruptive behaviors did differ within conditions. Although not a target of the intervention, call-outs accelerated the most during individual, rather than peer, mediated SAFMEDS. The increase appears linked to the increased number of steps, lack of experience with the intervention, and no immediate feedback. Classic research in applied behavioral analysis has confirmed that delivering positive feedback when students engage in desired behavior will increase the likelihood they will demonstrate that behavior in the future (Madsen, Becker, & Thomas, 1968). Therefore, students in emotional and behavioral support programs typically receive frequent positive feedback to help modify and encourage positive behaviors. Working alone, the students did not receive immediate feedback from others, perhaps increasing attention-seeking behaviors. Anecdotally, students called-out to the teacher and peers to tell how many corrects the scored.

Peer-mediated conditions, on the other hand, produced fewer callouts. Andrew showed the greatest decrease when working with Peer SAFMEDS. A noted benefit of peer-mediated instruction involves frequent opportunities to respond and demonstrate understanding while receiving immediate and corrective feedback and praise (Bowman-Perrott et al., 2013; Greenwood et al., 1992; Maheady et al., 1988). In addition to fewer disruptive behaviors, Andrew also asked to work with peers on other assignments. The combination of effective gains, reductions in disruptive behaviors, and improved relationship building meets the definition of an effective multifaceted intervention.

6.1 LIMITATIONS

Although, improvement in vocabulary acquisition were observed a number of limitations should be considered when interpreting the results of this study. First, the small sample size precluded (a) additional analysis to determine the relationship of levels of intervention, age, gender, and so forth, of the outcomes, and (b) conclusive recommendations. Second, although comprehensive, the interventions were implemented for a relatively short period, perhaps limiting the overall impact. Another limitation was the procedural integrity and the student's ability to follow the multi-step directions as required in SAFMEDS. Due to a low procedural integrity scores the effects of the intervention may have been diluted, providing a less than accurate picture of its effect on the dependent variables.

6.2 IMPLICATIONS AND FUTURE DIRECTIONS

Although, the academic outcomes were modest and behavioral results were relatively inconclusive in relation to academics, this study suggests several implications for practice and research. First, general academic interventions are plausible to be conducted with students identified as EBD. SAFMEDS, especially peer mediated SAFMEDS has the potential to be very effective both academically and behaviorally when implemented with fidelity. Additional training and practice must be conducted prior to the intervention probes. Future studies should provide additional and guided practice daily for several consecutive days until the students demonstrate fluency with the steps.

In addition, with the excitement of getting an additional number of corrects it would important for future studies to investigate the effect of self-graphing of academic data by students with EBD has on various academic and behavioral measures to determine the strength of this intervention component. Some of the challenges faced with implementing peer-meditated instruction in this setting are unavoidable. The social skills of students with EBD can limit the available options for student pairs, as some students may not interact well with others. This could threaten the efficacy of the intervention (Sutherland, Wehby & Gunter, 2000). In the current study, the teacher's knowledge of the student's personality to resulted in appropriate dyads that allowed for effective peer-mediated intervention. Other circumstances in in a typical emotional support classroom where the intervention could not be implemented, such as when a partner was absent, aggressive behaviors were occurring, elopement, and typical challenges with a school calendar (field trips, early dismissals, holidays). Coleman and Vaughn (2000) noted that the emotional variable suggested by the teachers of students with EBD impacts a teacher's ability to

effectively implement any effective reading instruction, especially peer-mediated interventions where social interaction is required.

APPENDIX A

TYPES OF PEER-MEDIATED INTERVENTION

Table 3. Types of Peer-Mediated Intervention

Intervention	Description
Class-Wide Peer Tutoring (CWPT)	Entire simultaneously participated in tutoring dyads. During each tutoring sessions, students can participate as both tutor and tutee, or they can participate as only the tutor or tutee.
Cooperative Learning	Small teams composed of students with different levels of ability use a variety of learning activities to improve their understanding o f a subject. Each member of a team is responsible not only for learning what is taught but also for helping teammates learn.
Cross-Age Tutoring	Older students are matched with younger students to deliver instruction. Tutors are typically 2 years older than the tutees. There do not needs to be large differences in skill levels between the tutor and tutee.
Peer Tutoring	Students who need remedial support are paired with select tutors (perhaps highly skills peers, peers also in need of remedial work, or cross-age tutors). Each member of the dyad may receive and provide tutoring in the same content area, or tutors can provide instruction in a content area in which they are highly skilled.
Peer-Assisted Learning Strategies (PALS)	A version of CWPT were teachers identify children who require help on specific skills and the most appropriate children to help them learn those skills. Pairs are changed regularly, and over time as students work on a variety of skills all students have the opportunity to be “coaches” and “players.”
Peer Assessment	Peers are used to assess the products or outcomes of learning of other students of similar status.
Peer Modeling	Students acting as peer models receive instruction in desired behaviors, they engage in these behaviors in front of students deficient in these area. The teacher draws the student’s attention to the peer model and identifies the desired behaviors the student should emulate.
Peer Reinforcement	Peers provide reinforcement for appropriate responses within the natural environment. The purpose is to reinforce appropriate behaviors of students with disabilities by their peers.

APPENDIX B

STUDIES OF PEER-MEDIATED INTERVENTION

Table 4. Studies of Peer-Mediated Intervention

Authors	N	Tutoring	Age	Race	Sex	Setting	Duration	Type/Subject
Barton-Arwood, Wehby, Falk (2005)	6	6: EBD	3rd grade 8yrs	Not Reported	2 F 4 M	Self-Contained Public School (Metropolitan)	27 weeks 3x's a week for 30 minutes	Peer-Assisted Learning Strategies/Reading
Bowman-Perrott, Greenwood & Tapia (2007)	19	19: EBD	5th-12th grade	12 Caucasian 6 African American 1 Hispanic	2 F 15 M	Alternative School (suburban and urban) *Small Teacher Student Ratio	6 months 3 x's a week for 30 minutes	Class-wide Peer Tutoring /Science
Bowman-Perrott (2009)	11	11: EBD	9th-12th grade	Not Reported	Not Reported	Alternative School	14 weeks 3x's a week for 30 minutes	Class-wide Peer Tutoring /Science (Biology)
Falk & Wehby (2001)	6	2: EBD 4: Speech with at-risk EBD	5-6 Years	Not Reported	6 M	Public school (Urban)	33 session 20-25 min each	Peer-Assisted Learning Strategies/ Reading (Phonics)
Franca & Kerr (1990)	8	8 : EBD	13-16 years	Not Reported	8 M	Self-Contained Private School (location not reported)	19,sessions 20 minutes each	Same-age Peer Tutoring/ Math
Kamps, Kravits, Stolze, & Swaggart (1999)	28	11: EBD 17:Reg Edu	1st-7th grade	5 Caucasian 23 African American	2 F 26 M	Public School (Urban)	1 year 4 waves (8 sessions each) 3 hours each	Class-wide Reciprocal Peer Tutoring/Reading
Staubitz, Cartledge, Yurick, & Lo (2005)	6	5: EBD 1 SLD at-risk EBD	4th-5th grade	1 Caucasian 5 African American 1 Hispanic	2 F 4 M	Public School (Urban)	32 Sessions 15minutes each	Peer-Mediated Repeated Reading/ Reading

Table 4 (continued)

Sutherland & Snyder (2007)	4	4:EBD	11-13 years	1 Caucasian 4 African American	2 F 2 M	Self-Contained Classroom Public School (City)	62 sessions 20 minute	Reciprocal Peer Tutoring/ Reading
Tournaki & Criscitiello (2003)	11	5 :EBD (tutors) 6: Reg Edu (tutees)	1st grade	9 African American 2 Hispanic	2 F 9 M	Public School Regular Edu Classroom (City)	20 school days 2 -20 minute sessions (one with tutoring one without)	Same-age Peer Tutoring (role reversal tutoring) Writing
Wehby, Falk, Barton-Arwood, Lane, & Cooley (2003)	8	8: EBD	7-10 yrs.	2 Caucasian 6 African American	8 M	Self-Contained School (Metropolitan)	12 weeks 3 x's a week 30 minute	Peer-Assisted Learning Strategies/ Reading

APPENDIX C

EXAMPLES OF FLASHCARDS

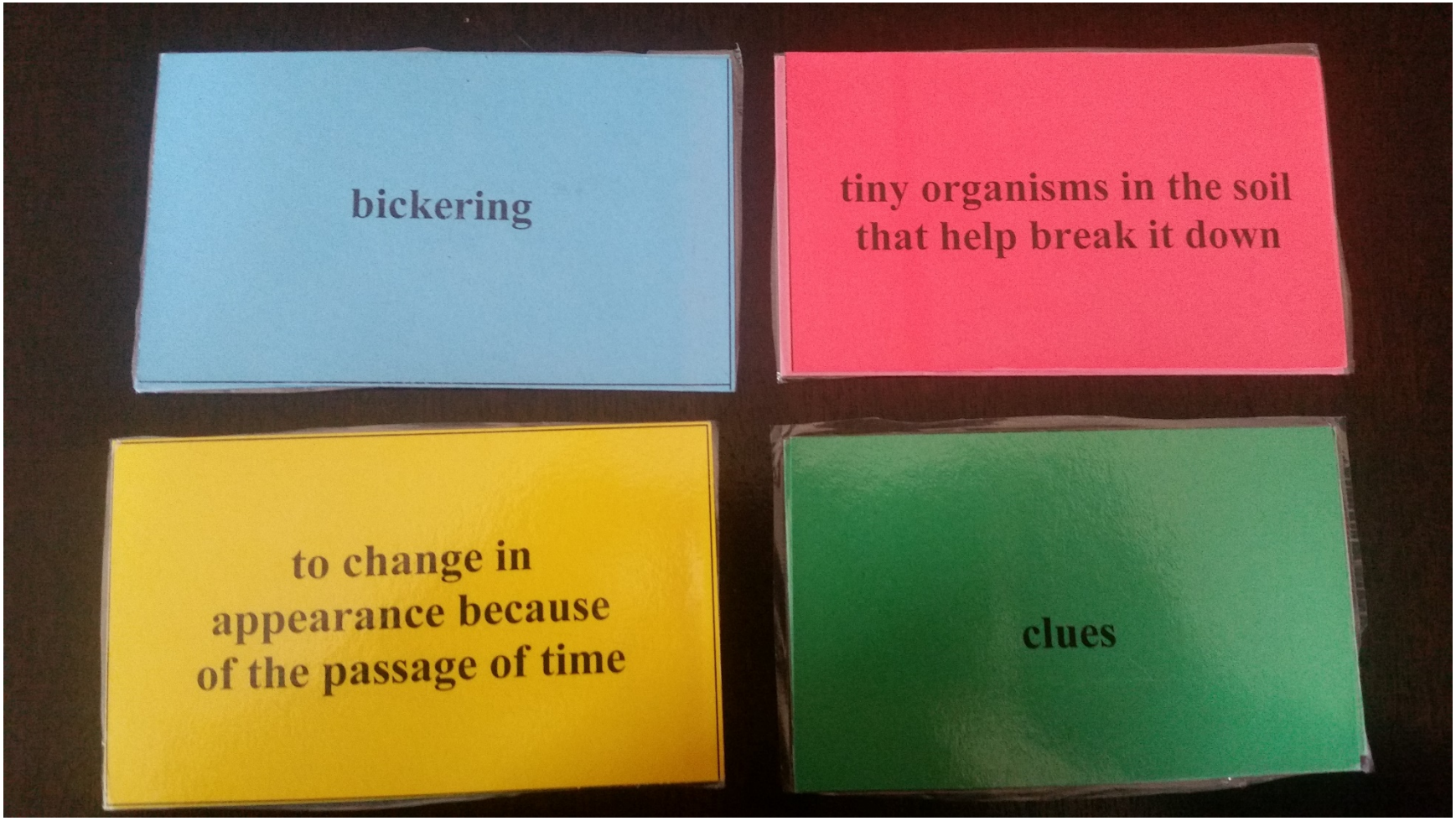

Figure 3. Examples of Flashcards

APPENDIX D

ASSESSMENT TERMS AND DEFINITIONS

Table 5. Types of Peer-Mediated Intervention

1	Red	adobe	a building made of clay and straw
2	Red	apartments	a large building containing residential suites
3	Red	brainstorm	to share ideas on a topic
4	Red	changes	make or become different
5	Red	communicate	to share information and ideas through speaking, writing, or drawing
6	Red	conclusions	the end or finish of an event
7	Red	contraption	a machine or devices that appears strange or complicated, often badly made or unsafe
8	Red	cruelty	behavior that causes pain or suffering
9	Red	decomposers	tiny organisms in the soil that help break it down
10	Red	devious	skillful use of underhanded tactics to achieve goals
11	Red	evidence	facts or information to determine if something is true
12	Red	furious	extremely angry
13	Red	gravel	part of soil, larger than sand, but smaller than rocks
14	Red	humus	decayed plant and animal material in the soil
15	Red	inorganic material	anything that does not come from living things
16	Red	job	paid position of regular employment
17	Red	loam	rich, loose soil
18	Red	observe	to use your senses to study something closely
19	Red	plot	to locate points on a graph
20	Red	problem	the matter or situation regarded as unwelcome or harmful and needing to be dealt with and overcome
21	Red	ramparts	defensive wall of a castle or walled city
22	Red	safe	protected from risk or harm
23	Red	senses	touch, taste, smell, sight, and hearing
24	Red	solution	means of solving a problem
25	Red	stem	the main body or stalk of a plant or shrub, typically rising above ground
26	Red	suspicious	showing cautious distrust of someone or something
27	Red	tend	to take care of
28	Red	thought	an idea or opinion
29	Red	traits	the quality or characteristic belonging to a person
30	Red	vacant	unused
31	Yellow	age	to change in appears because of the passage of time
32	Yellow	banner	a long strip of cloth bearing a slogan or design, hung in a public place or carried in a demonstration or procession
33	Yellow	bureau	part of the government
34	Yellow	character	a person in a novel, play, or movie

Table 5 (continued)

35	Yellow	community	a group of people living in the same place or having a particular characteristic in common
36	Yellow	condensation	the process by which a gas changes to a liquid
37	Yellow	country	a nation; a land under a government
38	Yellow	culprit	a person who is responsible for a crime
39	Yellow	describe	to use words to explain how something looks, feels, or acts
40	Yellow	digestive	of or relating to the process of digesting food
41	Yellow	evaporation	the process by which a liquid becomes a gas
42	Yellow	gas	a substance that has no shape or volume but can expand
43	Yellow	green space	an area of grass, trees, or other vegetation set apart for recreational or aesthetic purposes in an otherwise urban environment
44	Yellow	idea	a thought or suggestion to a possible course of action
45	Yellow	interior	the inside of something
46	Yellow	lagoon	a stretch of saltwater separated from the sea by a low sandbank
47	Yellow	matter	anything that has weight and takes up space
48	Yellow	organic	coming from living things
49	Yellow	pluck	to take hold of something and quickly remove it from its place
50	Yellow	procedure	a set of steps that tells how to do something
51	Yellow	reception	a social gathering for welcoming
52	Yellow	sand	part of soil, smaller than gravel but bigger than silt or clay
53	Yellow	sequence	a particular order in which related events follow each other
54	Yellow	sort	to put things together on the basis of a property, such as color or size
55	Yellow	stray	having been lost
56	Yellow	swayed	move or cause to move slowly or rhythmically backward and forward or from side to side
57	Yellow	text	a book or other written printed work
58	Yellow	through	moving in one side and out the other side of
59	Yellow	transportation	the action of moving someone or something
60	Yellow	volume	the amount of space that something takes up
61	Blue	ancient	belonging to the vey distance past and no longer in existence
62	Blue	bickering	argue about petty and trivial matters
63	Blue	cause	a person or thing that gives rise to can action
64	Blue	citizens	legally recognized subject or national of a state or commonwealth
65	Blue	component	part of something
66	Blue	connections	relationship in which a person or idea is linked or associated with something else
67	Blue	crept	move slowly and carefully to avoid being heard or noticed
68	Blue	data	information, such as that gathered during an experiment
69	Blue	detail	an individual feature, fact, or item
70	Blue	dissolve	to make or become part of a liquid mixture

Table 5 (continued)

71	Blue	experiment	a procedure that is carried out to investigate a scientific question
72	Blue	germination	the process by which a seed swells up and begins to sprout and develop roots
73	Blue	gullet	the passage by which food passes from the mouth to the stomach; the esophagus
74	Blue	important	of great significance or value
75	Blue	intestine	organs that help process food. There are small and large intestines
76	Blue	laws	the system or rules that particular country or community follow and enforce penalties
77	Blue	mixture	combination of two or more substances in which each substance keeps its own properties
78	Blue	organism	a living thing
79	Blue	predication	a forecast, a guess
80	Blue	property	something about an object that helps tell what it is
81	Blue	relationships	the way in which two or more objects, concepts or people are connected
82	Blue	sapling	a young tree
83	Blue	silt	part of soil, smaller than sand, but bigger than clay
84	Blue	stakeout	a period of secret surveillance of building or area by police
85	Blue	strode	walk with long decisive steps in a specific direction
86	Blue	synthesize	make something, especially chemically
87	Blue	texture	the feel or look of something
88	Blue	thundering	Making a rounding loud, deep noise
89	Blue	twilight	soft glowing light from sky as the sun sets
90	Blue	volunteers	people who do something without getting paid
91	Green	anthem	uplifting song identified with a particular group or cause
92	Green	boiling point	the temperature at which heated liquid turns into a gas
93	Green	challenge	a call to take part in a contest or competition
94	Green	clues	evidence or information used in the detection of crime or solving of a mystery
95	Green	compost	mixture of decayed leaves, vegetables, and other plant material
96	Green	continent	any of the world's main continuous expanses of land (Africa, Antarctica, Asia, Australia, Europe, North America, South America
97	Green	crop	a plant that is grown as food, especially a grain, fruit or vegetable
98	Green	decay	the process by which dead organic material breaks down or to rot
99	Green	detective	a person, especially a police officer who occupation is to investigate and solve crimes
100	Green	effect	a change that is a result of a consequence of an action
101	Green	freezing point	the temperature at which a liquid becomes a solid
102	Green	goods	personal property or articles of trade (wares or merchandise)
103	Green	harvest	the process of gathering crops
104	Green	inferences	a conclusion reached on the basis of evidence
105	Green	inventors	a person who invented a particular device or process

Table 5 (continued)

106	Green	liquid	substance with no shape but does have volume
107	Green	need	something required
108	Green	peasant	poor famer of low social status who owns or rents small piece of land for cultivation
109	Green	present	current time
110	Green	protect	to defend from or stop harm
111	Green	reservation	land set aside for Indians
112	Green	selfish	a person lacking consideration for others for one's own pleasure
113	Green	soil	the top layer of earth in which plants grow
114	Green	startled	to disturb or agitate suddenly as by surprise
115	Green	summarize	brief statement of the main points
116	Green	tasty	having a pleasant or nice flavor
117	Green	think	to have a particular belief, opinion, or idea about something
118	Green	tool	an object used to do a task
119	Green	urban	relating to a city
120	Green	work	activity involving mental or physical effort done in order to achieve a purpose or result
121	Screening	city	a large town
122	Screening	comparisons	how things are alike or the same
123	Screening	contrast	how things are different
124	Screening	different	not the same
125	Screening	Earth	The planet on which we live
126	Screening	esophagus	connects the throat to the stomach
127	Screening	fluids	liquid
128	Screening	frass	waste material of the caterpillar
129	Screening	future	time still to come
130	Screening	hatch	to come from an egg
131	Screening	humus	decayed plant and animal material in the soil
132	Screening	life cycle	the series of changes in the life of an organism including reproduction
133	Screening	near	at a short distance, nearby
134	Screening	never	at no time
135	Screening	object	something you can see or feel
136	Screening	pattern	Repeating arrangement of something
137	Screening	perilous	full of danger or risk
138	Screening	plants	a living organism
139	Screening	predict	to say what you think is going to happen
140	Screening	react	the action that happens when two substances combine or break apart and form a new substance
141	Screening	roots	the part of a plant that attaches to the ground to support, typically underground

Table 5 (continued)

142	Screening	saw	a hand tool for cutting wood
143	Screening	setting	the place or surrounding where something takes place
144	Screening	steamboat	a boat that is run by a steam engine, especially a paddle-wheel craft used on rivers in the 19th century
145	Screening	stems	the main body or stalk of a plant or shrub, typically rising above ground
146	Screening	towered	rise to great height
147	Screening	volume	the amount of space that something takes up
148	Screening	waist	part of the human body below the ribs and above the hips
149	Screening	weight	the force of gravity on something
150	Screening	year	the period of 365 days

APPENDIX E

PROCEDURAL PROMPT CARDS

Red Deck

Participant: Person Being Quizzed ***Peer:Person Quizzing (Tutor)***

1. Decide who will be the peer first and who will be the participant first.
2. Participant - set the countdown timer for 6 minutes and press start

Cold Sprint

3. Peer -Shuffle Cards & set another timer for 30 seconds
4. Peer- Remind participant to "Say each term as fast as they can or say pass".
5. Peer- Shows participant cards with definition
6. Peer -will make two piles, correct responses & incorrect responses
7. When 30 seconds ends the peer says stop
8. Participant-will record scores on cold side
9. Switch Roles and Record

Practice

10. Peer-Set the timer for 3 minutes
11. Peer show each definition to the participant, participant will state the term
12. Peer will immediately correct the participant of each incorrect term
13. After 1 turn through the deck, they will switch roles and repeat, continuing until the 3 minute timer sounds.

Hot Sprint

14. Peer -Shuffle Cards & set another timer for 30 seconds
15. Peer- Remind participant to "Say each term as fast as they can or say pass".
16. Peer- Shows participant cards with definition
17. Peer -will make two piles, correct responses & incorrect responses
18. When 30 seconds ends the peer says stop
19. Participant-will record scores on hot side
20. Switch Roles and Record

** If the 6 minute timer goes off before completion, stop, clean up, and return to class**

Green Deck

1. Set the countdown timer for 6 minutes and press start

Cold Sprint

2. Shuffle the deck and set another timer for 30 seconds.
3. Say the terms as fast as possible by viewing the definition and stating the term.
4. Place cards into two piles correct and incorrect. (You may pass and place cards back into quiz deck)
5. After 30 Seconds, Record data on cold side.

Practice

6. Set timer for 4 minutes and shuffle deck
7. Go through entire deck reading the definition and flipping over to identify the terms, reshuffle after each time through
8. Continue this process until the four-minute timer sounds

Hot Sprint

9. Shuffle the deck and set another timer for 30 seconds.
10. Say the terms as fast as possible by viewing the definition and stating the term.
11. Place cards into two piles correct and incorrect. (You may pass and place cards back into quiz deck)
12. After 30 Seconds, Record data on hot side.

** If the 6 minute timer goes off before completion, stop, clean up, and return to class**

Yellow Deck

Participant: Person Being Quizzed
Peer:Person Quizzing (Tutor)

1. Decide who will be the peer first and who will be the participant first.
2. Participant - set the countdown timer for 6 minutes and press start
3. Peer – Shuffle the deck of cards
4. Review each flash card aloud front and back
5. When the timer sounds place the cards in the middle of the table and notify experimenter.

Blue Deck

1. Set the countdown timer for 6 minutes and press start
2. Shuffle the deck of cards
3. Review each flash card front and back
4. When the timer sounds place the cards in the middle of the table and notify experimenter.

Figure 4. Procedural Prompt Cards

APPENDIX F

COLOR CODED DATA SHEETS

Name: _____

	30 Seconds - Red Deck COLD			30 Seconds - Red Deck HOT		
	Date	**Number Correct**	**Number Incorrect**	**Date**	**Number Correct**	**Number Incorrect**
Session 1						
Session 2						
Session 3						
Session 4						
Session 5						
Session 6						
Session 7						
Session 8						

Name: _____

	30 Seconds - Green Deck COLD				30 Seconds - Green Deck HOT		
	Date	**Number Correct**	**Number Incorrect**		**Date**	**Number Correct**	**Number Incorrect**
Session 1							
Session 2							
Session 3							
Session 4							
Session 5							
Session 6							
Session 7							
Session 8							

Name: _____

	30 Seconds - Yellow Deck		
	Date	**Number of Correct Words**	**Number of Incorrect Words**
Session 1			
Session 2			
Session 3			
Session 4			
Session 5			
Session 6			
Session 7			
Session 8			

Name: _____

	30 Seconds - Blue Deck		
	Date	**Number of Correct Words**	**Number of Incorrect Words**
Session 1			
Session 2			
Session 3			
Session 4			
Session 5			
Session 6			
Session 7			
Session 8			

Figure 5. Color Coded Data Sheets

APPENDIX G

SOCIAL VALIDITY

G1: Peer-Mediated Learning & SAFMEDS Student Survey

Peer-Mediated Learning & SAFMEDS Student Survey

Circle how you feel about the questions.

1. Did you like the peer-tutoring Activities?

Yes Kind of No

2. Do you like helping others?

Yes Kind of No

3. Did you like your partners?

Yes Kind of No

4. Would you like to do peer-tutoring again?

Yes Kind of No

5. Would you like to work with your partner again?

Yes Kind of No

6. Do you think the peer-tutoring vocabulary activities helped you learn?

Yes Kind of No

7. Do you think you learned better working with a partner than independently?

Yes Kind of No

8. Did you like SAFMEDs with a partner?

Yes Kind of No

9. Did you like independently studying with a partner?

Yes Kind of No

10. I would like work to work with peer-tutoring in the future

Yes Kind of No

11. Which did you like better, SAFMEDs or independently studying and why?

_____
_____
_____
_____

12. What did you like about peer-tutoring?

_____
_____
_____
_____

13. What did you dislike about peer-tutoring?

_____
_____
_____
_____
_____

14. What would you change about peer-tutoring in the future?

_____
_____
_____
_____
_____

Figure 6. Student Survey

G2: Peer Tutoring Teacher Survey

Peer Tutoring Teacher Survey

Please read each item carefully, and then check the answer that best reflects your perceptions.

Question	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Comments
Peer tutoring was helpful in improving social interactions for participants						
Peer tutoring was helpful in improving positive behaviors for participants						
I think peer tutoring was helpful in decreasing negative interactions for participants.						
I think peer tutoring was helpful for both participants and peers to become more academically competent in vocabulary						
I think peer tutoring was helping for participants and peers to increase their vocabulary acquisition						
The peer tutoring intervention would be good fit for my classroom.						
The SAFMEDS intervention would be a good fit for my classroom						
I think the intervention was disruptive to classroom activities/instruction						
I would recommend this intervention to other teachers						
I could use this intervention in my classroom with different types of students or behaviors.						

Figure 7. Teacher Survey

APPENDIX H

TREATMENT INTEGRITY

Condition Red: Peer-Mediated with SAFMEDS			
Integrity Checklist			
Correctly Carried Out?	Step	Student Action	Notes
____Y____N	1	Promptly initiates session, choosing peer and participant.	
____Y____N	2	Sets Timer for 6 minutes	
____Y____N	3	Shuffles cards and sets additional timer for 30 seconds	
____Y____N	4	Peer remind participant to “Say each term as fast as they can or they say pass”	
____Y____N	5	Peer shows card definition to participant and makes 2 piles (correct & incorrect)	
____Y____N	6	Record Information on cold side	
____Y____N	7	Students Switch Roles; Shuffles cards and sets additional timer for 30 seconds	
____Y____N	8	Peer remind participant to “Say each term as fast as they can or they say pass”	
____Y____N	9	Peer show card definition to participant and makes 2 piles (correct & incorrect)	
____Y____N	10	Record Information on cold side	
____Y____N	11	Set Timer for 3 Minutes	
____Y____N	12	Peer shows each definition to the participant, participant will state the term with the peer immediately providing corrections	
____Y____N	13	After 1 turn through the deck, students will switch roles and repeat, continuing until the 3 minute timer sounds.	
____Y____N	14	Peer -Shuffle Cards & set another timer for 30 seconds	

____Y____N	15	The Peer remind participant to “Say each term as fast as they can or say pass”.	
____Y____N	16	The Peer shows participant cards with definition and makes two piles with correct responses & incorrect responses	
____Y____N	17	When 30 Seconds Sounds the Peer says stop	
____Y____N	18	Participant records scores on hot side	
____Y____N	19	The students switch roles, shuffle cards, and sets the timer for 30 seconds	
____Y____N	20	The Peer remind participant to “Say each term as fast as they can or say pass”.	
____Y____N	21	The Peer shows participant cards with definition and makes two piles with correct responses & incorrect responses	
____Y____N	22	When 30 Seconds Sounds the Peer says stop and records scores on hot side	

Condition Green: Individuals with SAFMEDS			
Integrity Checklist			
Correctly Carried Out?	Step	Student Action	Notes
____Y____N	1	The student promptly initiates session and sets the countdown timer for 6 minutes and presses start	
____Y____N	2	The student shuffles the deck and sets another timer for 30 seconds	
____Y____N	3	The student says the terms as fast as possible by viewing the definition and stating the term while placing cards into two piles correct and incorrect.	
____Y____N	4	The student records corrects and incorrects on cold side of the data sheet	
____Y____N	5	Student sets the timer for 4 minutes, shuffles deck, and go through entire deck reading the definition and flipping over to identify the terms. Student will reshuffling each time through the deck.	
____Y____N	6	Student shuffles the deck and set another timer for 30 seconds.	
____Y____N	7	Say the terms as fast as possible by viewing the definition and stating the term, placing the cards into 2 piles correct and incorrect.	

____Y____N	8	After 30 seconds student will record data on the hot side	
____Y____N	9	Peer show card definition to participant and makes 2 piles (correct & incorrect)	
____Y____N	10	Record Information on cold side	
____Y____N	11	Set Timer for 3 Minutes	
____Y____N	12	Peer shows each definition to the participant, participant will state the term with the peer immediately providing corrections	
____Y____N	13	After 1 turn through the deck, students will switch roles and repeat, continuing until the 3 minute timer sounds.	
____Y____N	14	Peer -Shuffle Cards & set another timer for 30 seconds	
____Y____N	15	The Peer remind participant to “Say each term as fast as they can or say pass”.	
____Y____N	16	The Peer shows participant cards with definition and makes two piles with correct responses & incorrect responses	
____Y____N	17	When 30 Seconds sounds the Peer says stop	
____Y____N	18	Participant records scores on hot side	

Condition Yellow: Peer-mediated with Flash Card Study			
Integrity Checklist			
Correctly Carried Out?	Step	Student Action	Notes
____Y____N	1	Students promptly decide who will be the peer first and who will be the participant first.	
____Y____N	2	The participant sets the countdown timer for 6 minutes and presses start.	
____Y____N	3	Peer shuffles the deck of cards	
____Y____N	4	The students review each flash card aloud front and back.	
____Y____N	5	When the timer sounds, the students place the cards in the middle of the table and notify experimenter.	

Condition Blue: Individual with Flash Card Study			
Integrity Checklist			
Correctly Carried Out?	Step	Student Action	Notes
____Y____N	1	Student promptly sets the countdown timer for 6 minutes and presses start	
____Y____N	2	Student shuffles the deck of cards	
____Y____N	3	The student reviews each flash card aloud front and back.	
____Y____N	4	When the timer sounds the students place the cards in the middle of the table and notify experimenter.	

Figure 8. Treatment Integrity Checklists

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