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## **An Evaluation of Paraprofessionals' Skills and Training Needs in Supporting Students with Severe Disabilities**

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### **Abstract**

*Careful consideration is essential for developing and conducting effective paraprofessional development. This study described a process of paraprofessional development and outcomes from assessments, workshops, and social validation focus group interviews from one rural public school in the USA. Fourteen paraprofessionals and their supervisors completed multiple surveys to indicate their perceived skill level and training needs before outside experts conducted a workshop on two high priority skill areas. Results showed that paraprofessionals increased their knowledge and skill development after a full-day workshop. Although paraprofessionals found the training procedures and targeted strategies to be socially valid, they identified challenges associated with implementation of the strategies and access to follow-up coaching.*

**Keywords:** *needs assessment, paraprofessional development, workshops, severe disabilities*

### **Introduction**

Paraprofessionals—who often provide individual support to and develop close relationships with students with extensive support needs—play an important role in advancing the educational outcomes of students with severe disabilities (Carter, O'Rourke,

Sisco, & Pelsue, 2009; Giangreco, Suter, & Doyle, 2010). Currently, the Individuals with Disabilities Education Act (IDEA) defines a paraprofessional as “a school employee who works under the direction of a certified staff member to support and assist in providing instructional programs and services to children with disabilities or eligible young children” (2008). Given the nature of the paraprofessional’s role in working with students with disabilities, it is critical for these individuals to have adequate knowledge and skills necessary to assist teachers and other professionals to address students’ support needs (Douglas, 2012; Stockall, 2014). Furthermore, paraprofessionals who work with students with severe disabilities will likely require a *specialized* set of skills to address the unique characteristics of this particular group of students (e.g., behavioral, motor, communication, medical). In the current study, we addressed the following two skill areas relevant to students with severe disabilities (Brown, McDonnell, & Snell, 2016) and that paraprofessionals address on a regular basis (Fisher & Pleasants, 2012): behavior management and social and communication supports.

In general, paraprofessionals often are the most undertrained among support providers in the school setting (Giangreco et al., 2010). Lacking the skills necessary to support students with disabilities due to limited pre-service training is further compounded by limited in-service training opportunities, with some paraprofessionals reporting to have received no training over an entire school year (Brown & Stanton-Chapman, 2017). As such, significant efforts have been made by various researchers to identify effective paraprofessional training strategies that yield positive outcomes regarding knowledge and skill acquisition (e.g., Brock & Carter, 2013; Walker & Smith, 2015). Brock and Carter (2013) conducted a literature review of intervention studies in which paraprofessionals implemented supports for students with intellectual and related developmental disabilities. The results of this review suggest that, with adequate training, paraprofessionals are able to implement various supports, including behavioral and social and communication supports, ultimately leading to positive student outcomes. For example, Walker and Snell (2017) conducted an intervention study in which three paraprofessionals received training comprised of two workshops and weekly coaching sessions to implement function-based interventions to address the challenging behavior of three students with autism and intellectual disability. The results indicated that brief and periodic training resulted in the successful implementation of the behavioral intervention by paraprofessionals and improvements in student behavior. Chung and Douglas (2015) also provided one to three individual training sessions (total of 35-50 min) to three paraprofessionals on facilitative strategies for promoting peer interactions with students who used speech-generating devices (SGD) in inclusive classrooms. Brief feedback sessions were also held after observations. Results illustrated increases in reciprocal peer interactions and in SGD use and gestures for students with severe disabilities. All paraprofessionals perceived the training to be beneficial.

Although the results of these studies are promising and provide evidence regarding effective paraprofessional training practices, additional research is needed to better understand training practices in the context of paraprofessional development as prescribed by schools or school districts and, further, the specific needs of paraprofessionals within rural schools or districts. Rural schools and districts often face unique challenges in the areas of special education personnel preparation, retention, and support (Chopra, Banerjee, DiPalma, Merrill, & Ferguson, 2013; Passaro, Pickett, Latham, & HongBo, 1994). For example, in a large-scale investigation across three rural states, Passaro and colleagues surveyed 286 paraprofessionals on their experiences and needs regarding training and supports. Although the majority of paraprofessionals (84%) reported receiving job training, the percentage of

paraprofessionals who perceived training as sufficient varied from 38-83% across the targeted states. Further, many of the paraprofessional respondents identified managing student behavior as a high-priority training area.

In this study, we worked with an individual school in a rural area to provide paraprofessional development. After collaborating with the school administrator to discuss and develop a paraprofessional development plan, we distributed multiple surveys to measure paraprofessionals' perceived skill level and training needs, facilitated workshops based on the assessment results, and offered coaching sessions. The specific research questions that guided this study included: (a) How do paraprofessionals and paraprofessionals' supervisors perceive their skill level and training needs across areas relevant to educating students with severe disabilities? (b) How do paraprofessionals perceive their skill level and training needs in strategies to manage challenging behavior and to promote and teach social and communication skills after training? (c) How do paraprofessionals perceive the feasibility of applying strategies covered in the training sessions? and (d) How do paraprofessionals perceive the practicality and efficacy of training sessions?

## Method

### Participants

Fourteen special education paraprofessionals who were employed at a public school for students with severe disabilities in a rural school district located in a Midwestern state in the USA participated in this study. Half of the participants had worked as a paraprofessional for 3-5 years (7, 50%). Others reported working in this role for 6-10 years (3, 21%), less than 1 year (2, 14%), and between 11-15 years (1, 7%); one participant did not report his/her experience as a paraprofessional. The average age of paraprofessionals was 49 years with a range of 28 to 57 years. A majority of paraprofessionals were female (13, 93%) and all reported their race/ethnicity as Caucasian. Education levels varied across paraprofessionals: some college experience (6, 43%), two-year Associate degree (4, 29%), Bachelor of Art or Bachelor of Science degree (3, 21%), and graduate degree (1, 7%). At the time of the study, paraprofessionals had experience working with students with varying disability diagnoses: autism (13, 93%), intellectual disability (10, 71%), multiple disabilities (12, 86%), speech or language impairment (11, 79%), hearing or visual impairment, including deaf and blindness (11, 79%), and traumatic brain injury (4, 29%).

### Measurement

Prior to the training workshop, we asked paraprofessionals and their supervisors (e.g., teachers, administrators, related support providers) to complete an online needs assessment to evaluate paraprofessionals' skill level and training needs in *assisting* teachers and other professionals across 10 broad areas relevant to learners with severe disabilities and commonly referenced in training materials in the field of severe disabilities (Brown, McDonnell, & Snell, 2016). Based on the results of this initial needs assessment, we administered a second, more focused survey prior to and following training sessions to assess changes in paraprofessionals' perceived skill level and training needs across two targeted areas: (a) managing challenging behaviors and (b) promoting functional communication and teaching social skills. Additionally, we gathered paraprofessional feedback at the conclusion of the study regarding the social validity of the training procedures and content of the training sessions. Respondents across all assessments remained anonymous, as personally identifiable

information was not collected.

**Initial needs assessment.** Paraprofessionals and 15 of their supervisors (e.g., supervising teachers, school administrators) completed an online needs assessment to evaluate paraprofessionals' skill level and training needs across 10 broad areas relevant to supporting teachers with learners with severe disabilities. Respondents rated perceived skill level and training needs using a 4-point Likert-type scale (1 = *none*, 2 = *low*, 3 = *moderate*, 4 = *high*). A description of these 10 areas and paraprofessional and school member ratings is presented in Table 1. Based on these results, we developed and administered an additional targeted assessment.

**Targeted assessment of paraprofessional skill level and training needs.** The pre- and post-assessment surveys measured paraprofessionals' perceived training needs and skill level in assisting teachers and other professionals across 10 activities associated with function-based intervention to address challenging behavior (see Table 2) and nine activities associated with social and communication supports (see Table 3). Survey items addressing function-based intervention were based on the previous work of Pindiprolu, Peterson, and Berglof (2007) and Walker (2017). Items addressing social and communication skills were derived from a collection of work by Brown and colleagues (2016). We asked paraprofessionals to rate their perceived skill level and training needs online using a 4-point Likert-type scale (1 = *none*, 2 = *low*, 3 = *moderate*, 4 = *high*). On average, respondents completed the survey in 11 min (range: 4-55 min).

**Social validity.** During a follow-up session at the conclusion of the paraprofessional development sessions, the paraprofessionals completed a paper-based social validity questionnaire to assess the acceptability of both the training procedures utilized during the workshop session and the targeted strategies covered during the workshop. Using a 4-point Likert-type scale (1 = *not at all*, 2 = *a little*, 3 = *a lot*, 4 = *a great deal*), paraprofessionals rated their satisfaction across the following four questions: (a) To what extent did the workshop improve your understanding of strategies to support students with challenging behaviors and/or social communication skill deficits? (b) To what extent did the workshop make you more confident in addressing students' behavioral and social communication needs? (c) To what extent have you used the strategies covered in the workshop? and (d) Overall, how satisfied are you with the workshop? In addition, the researchers conducted a brief social validity interview (approximately 30 min in length) with two groups comprised of the original 14 paraprofessional participants. The following questions guided the interview: (a) Have you implemented strategies that were covered in the workshop session? (b) Do you think coaching may have been a helpful support when working with other classroom staff to identify and implement these strategies? and (c) What were some of the challenges or barriers that prevented you from receiving coaching? Additional follow-up questions were included to clarify or expand on participant responses.

### Training Procedures

Over the course of the academic school year, we collaborated with the school administrators to develop and implement the training procedures described here. It should be noted that paraprofessionals were required to attend the brief orientation, workshop, and follow-up sessions to meet the paraprofessional development requirements set forth by the school district; the ongoing coaching activity was voluntary and, unfortunately, none of the paraprofessionals participated in the coaching element of the study. As such, we conducted a social validity interview at the conclusion of the paraprofessional development to explore

further the potential barriers to coaching paraprofessionals.

**Brief orientation.** A brief two-hour orientation was held early in September. During the orientation, we shared the results of the initial needs assessment (see Table 1) and the second follow-up survey (see Tables 2 and 3) and facilitated a group discussion to ensure that participants found the targeted training topics to be relevant and valuable. All participants confirmed that the proposed training topics of managing challenging behaviors and promoting communication and social skills were of high priority and socially valid. Two warm-up activities were provided to promote discussion among participants prior to the workshop session. First, we gave each paraprofessional a copy of the Communication Bill of Rights (National Joint Committee, 1992) and asked them to rate the extent to which each communication right was relevant to their students (*always, sometimes, never*). Second, we asked paraprofessionals to participate in a hot button activity (see [www.vanderbilt.edu/csefel](http://www.vanderbilt.edu/csefel)) during which they identified (a) challenging behaviors that “pushed their buttons,” (b) emotions they encountered when faced with the identified behaviors, and (c) the effect their emotions had on their relationships with the students who engaged in the behaviors. During both warm-up activities, participants initially completed the activity independently but later voluntarily shared their responses with the whole group. Both activities resulted in group discussion about both training topics.

We also outlined the training plan for the remainder of the academic year and reviewed the consent process and corresponding forms; participants had the option to submit consent forms at the conclusion of the orientation or via mail. At the conclusion of the brief orientation, we asked small groups of participants to write short-term and long-term vision statements for their students, characterizing students’ quality of life as a valued and included member of the community (Meadan, Shelden, Appel, & DeGrazia, 2010). The purpose of this closing activity was to establish high expectations for students with severe disabilities among participating paraprofessionals prior to training.

**Workshop.** An all-day workshop was held in late October. The purpose of the workshop was to provide training to paraprofessionals on topics that were previously identified as high priority. The workshop was comprised of a variety of training activities, including distribution of resources and materials, PowerPoint lectures, case studies, video exemplars, demonstrations, role-plays, and knowledge checks. After the workshop session, participants were encouraged to implement the targeted strategies with their students, and to receive additional support and feedback (i.e., coaching) from the researchers during implementation efforts. However, none of the paraprofessionals requested this additional assistance.

The first part of the workshop (3.5 hours) addressed strategies to promote social and communication skills. We began by describing characteristics of social communication of students with severe disabilities and the importance of promoting these outcomes. We then discussed strategies that addressed where communication can take place, what topics can be motivating, and how effective, functional communication can be taught. The paraprofessionals received a copy of the PowerPoint presentation notes, watched videos illustrating successful implementation of communication strategies, and role-played instructional procedures to promote communication (i.e., modelling, mand-modelling, time delay). Paraprofessionals also practiced teaching within the different phases of the Picture Exchange Communication System (PECS; Bondy & Frost, 1994) and selecting appropriate vocabulary. This part of the workshop concluded with each paraprofessional developing an

action plan for enhancing at least one student's communication skills during the next school day.

The second part of the workshop (3.5 hours) addressed function-based strategies to address students' challenging behaviors (i.e., functional behavior assessment [FBA], development and implementation of function-based behavioral supports). A description of FBA and behavioral supports goes beyond the scope of this paper; however, readers are encouraged to access other resources for more information (e.g., O'Neill, Albin, Storey, Horner, & Sprague, 2014). We provided paraprofessionals with a copy of the PowerPoint lecture, including several worksheets that corresponded to the knowledge check activities (e.g., reflection questions, practice activities). We demonstrated the process of conducting an FBA and identifying behavioral supports based on the results. In addition, several videos of a student with a severe disability who engaged in persistent challenging behavior were used to illustrate these concepts and provided additional opportunities to practice applying targeted skills. Paraprofessionals practiced collecting FBA data, developing hypotheses, and identifying behavioral supports based on the student in the video examples.

Due to the nature of their role, paraprofessionals are not responsible for conducting FBAs or developing corresponding behavioral interventions; however, we included this content in the workshop session, as we believe that paraprofessionals, with a basic understanding of the process through which function-driven interventions are developed, will be more successful and motivated when addressing challenging behavior (Walker & Snell, 2017). Furthermore, paraprofessionals will likely assist teachers and other professionals in conducting FBAs and, therefore, are likely to benefit from training.

**Follow-up.** A two-hour follow-up session was held in mid-April. The purpose of this session was to provide paraprofessionals with an opportunity to reflect on their experiences, including accomplishments and challenges, with implementing the targeted strategies covered in the workshop session. We also asked paraprofessionals to complete a questionnaire and participate in a brief focus group interview to assess the social validity of the training procedures and strategies implemented by the paraprofessionals and gather information about barriers to accessing the voluntary coaching.

## Data Analysis

To analyze the results from the initial needs assessment and the pre- and post- skill level and training surveys, we transferred participant responses to Microsoft Excel® to calculate descriptive statistics (i.e., frequency, percentage of responses). Social validity questionnaire data were also analyzed in Microsoft Excel® to identify frequency, percentage, and mean rates of responding across the Likert-type scale response options. Additionally, recorded interviews were analyzed to identify categorical themes. Initially, the first author transcribed paraprofessionals' audio recorded responses to the social validity interview questions. Subsequently, responses were sorted into categorical themes and reviewed and confirmed by a second reviewer.

## Results

Prior to the brief orientation, paraprofessionals and supervisors rated paraprofessionals' skill level and training needs across 10 areas relevant to teaching students with severe disabilities (see Table 1).

**Table 1. Initial Needs Assessment Survey Results**

Skill area	Skill level % low or none ( <i>n</i> )		Training needs % moderate or high ( <i>n</i> )	
	Paraprofessional	Supervisor	Paraprofessional	Supervisor
Managing challenging behavior	0% (0)	7% (1)	64% (9)	86% (13)
Teaching self-care skills	8% (1)	27% (4)	46% (6)	60% (9)
Facilitating peer relationships	21% (3)	34% (5)	71% (10)	80% (12)
Promoting functional communication	14% (2)	27% (4)	50% (7)	72% (10)
Teaching vocational skills	61% (8)	43% (6)	69% (9)	77% (10)
Preparing students to transition from school to community	30% (4)	61% (8)	62% (8)	54% (7)
Increasing students' self-determination	34% (4)	43% (6)	50% (6)	72% (10)
Teaching academic skills	39% (5)	34% (5)	46% (6)	71% (10)
Teaching social skills	8% (1)	36% (5)	59% (7)	78% (11)
Supporting students' physical and health needs	16% (2)	13% (2)	75% (9)	57% (8)

Note. Response scale: 1 (*none*), 2 (*low*), 3 (*moderate*), and 4 (*high*). Not all of the participants responded to each item, thus percentages reflect the percentage of those who responded to that particular item.

Paraprofessionals most often reported having a low skill level (*low or none*) in the areas of teaching vocational skills (8, 61%), teaching academic skills (5, 39%), and increasing students' self-determination (4, 34%). Although supervisors most often identified preparing students to transition from school to community as a low skill area (8, 61%), they also reported teaching vocational skills (6, 43%) and increasing students' self-determination (6, 43%) as low skill areas. A notable difference was found between supervisor and paraprofessional ratings of training needs across these same 10 areas; paraprofessionals reported moderate or high training needs across the following three areas: facilitating peer relationships (10, 71%), supporting students' physical and health needs (9, 75%), and teaching vocational skills (9, 69%). However, supervisors reported the following as high-priority training areas: managing challenging behavior (13, 86%), facilitating peer relationships (12, 80%), and teaching social skills (11, 78%).

The results of the subsequent pre- and post-assessment surveys addressing the specific

areas of managing challenging behavior and social and communication skills are presented in Tables 2 and 3, respectively.

**Table 2. Pre- and Post-Assessment Survey Results – Managing Challenging Behavior**

Skill area	Skill level % low or none (n)		Training needs % moderate or high (n)	
	Pre	Post	Pre	Post
Interviewing caregivers (e.g., parents/guardians, teachers, and staff, etc.) regarding challenging behavior	50% (4)	33% (3)	25% (2)	11% (1)
Developing a summary based on interview data that includes: (a) events that occur prior to challenging behavior, (b) challenging behavior, and (c) the possible function or purpose of challenging behavior	72% (5)	44% (4)	57% (4)	22% (2)
Defining or describing challenging behaviors so that they can be observed and measured	25% (2)	0% (0)	38% (3)	11% (1)
Collecting data on challenging behavior through observations	13% (1)	0% (0)	25% (2)	11% (1)
Analysing observational data to determine the function or purpose of challenging behavior	25% (2)	11% (1)	50% (4)	22% (2)
Developing a summary based on observational data that includes: (a) events that occur prior to challenging behavior, (b) challenging behavior, and (c) the possible function or purpose of challenging behavior	43% (3)	22% (2)	57% (4)	22% (2)
Developing intervention plans to decrease challenging behavior and increase desired behavior	50% (4)	11% (1)	50% (4)	22% (2)
Selecting intervention plan strategies that address the purpose or function of the challenging behavior	50% (4)	11% (1)	50% (4)	11% (1)
Implementing intervention plan strategies	25% (2)	11% (1)	38% (3)	11% (1)
Collecting data to determine the changes in behavior while implementing intervention plan strategies	38% (3)	22% (2)	38% (3)	11% (1)

*Note.* Response scale: 1 (*none*), 2 (*low*), 3 (*moderate*), and 4 (*high*). Not all of the participants responded to each item, thus percentages reflect the percentage of those who responded to that particular item.

**Table 3. Pre- and Post-Assessment Survey Results – Social and Communication Skills**

Skill area	Skill level % low or none (n)		Training needs % moderate or high (n)	
	Pre	Post	Pre	Post
Creating opportunities for peer interactions within the school environment (e.g., creating shared space, arranging shared activities, and incorporating common interests within group activities)	50% (4)	33% (3)	25% (2)	22% (2)
Creating opportunities for peer interactions outside of the school environment (e.g., encouraging social gatherings)	50% (4)	33% (3)	14% (1)	22% (2)
Ensuring that AAC devices are programmed so that students who communicate with these devices have the opportunity to engage in social interactions with both peers and adults	63% (5)	22% (2)	25% (2)	11% (1)
Programming AAC devices	38% (3)	22% (2)	25% (2)	11% (1)
Maintaining and/or teaching students to maintain their AAC devices (e.g., charging battery, backing up AAC device)	50% (4)	11% (1)	25% (2)	0% (0)
Facilitating peer interactions during play and other leisure activities	50% (4)	11% (1)	25% (2)	0% (0)
Teaching students to interact with adults by requesting, commenting, questioning, responding, etc.	50% (4)	0% (0)	14% (1)	11% (1)
Teaching students to interact with peers by requesting, commenting, questioning, responding, etc.	60% (3)	11% (1)	25% (1)	11% (1)
Addressing other potential barriers to social interactions (e.g., student hygiene, unconventional body language, etc.)	57% (4)	11% (1)	33% (2)	11% (1)

Note. Response scale: 1 (*none*), 2 (*low*), 3 (*moderate*), and 4 (*high*). Not all of the participants responded to each item, thus percentages reflect the percentage of those who responded to that particular item.

In general, paraprofessionals' perceived skill level increased (as evidenced by a reduction in ratings of skill level as *low or none*) and training needs decreased (as evidenced by a reduction in ratings of training needs as *moderate or high*) across both targeted areas after participation in the brief orientation and workshop sessions.

Overall, paraprofessionals found both the training procedures (i.e., brief orientation, workshop) and targeted strategies to be socially valid. All paraprofessionals reported to be satisfied (ratings of *a lot* or *a great deal*) across the four items in the social validity questionnaire. The following three themes emerged from the social validity interviews. First, paraprofessionals reported implementing targeted strategies soon after the conclusion of the workshop but these efforts eventually diminished due to other competing responsibilities and a lack of implementation consistency among supervising teachers who provided behavioral and social/communication support to students. Second, and in despite of the fact that none of the paraprofessionals participated in coaching during the course of this study, respondents

acknowledged that coaching would be a helpful support, noting that coaching from supervising teachers may be more beneficial than from an outside expert such as a researcher. Third, paraprofessionals suggested that coaching was not pursued during this study due to limited time to dedicate to coaching sessions, anxiety induced by the presence of an outside observer in the classroom, or adverse reactions of students due to observer presence.

## Discussion

This study was designed to assess the perceived skill level and training needs of paraprofessionals, facilitate workshops based on assessment results, and offer coaching sessions to further enhance specific skills. After an initial needs assessment completed by paraprofessionals and supervisors, we administered a targeted survey on function-based intervention and social and communication skill development. The results led to a full-day workshop promoting knowledge and skill development in these two skill areas.

The initial needs assessment illustrated some similarities between paraprofessional and supervisor skill level responses, somewhat mirroring the results from previous research (e.g., Passaro et al., 1994). This finding indicated that, while both supervisors and paraprofessionals may have an understanding of the current skill level of paraprofessionals, their perspectives of training priorities are different. We opted to address those priority areas identified by supervisors, but assessed social validity with paraprofessionals before proceeding with training. Differences in reported training needs may be explained by determining whether such reports were based on paraprofessionals' actual skill set (or lack thereof) or a personal preference of the supervisor and paraprofessional. These results also exemplify a need for collaboration among paraprofessionals and supervisors to devise plans for training development (Douglas, Chapin, & Nolan, 2016; Stockall, 2014) that align with both the needs of the paraprofessionals and the needs of the school, classroom, and student body. Nonetheless, we found that, by administering a needs assessment, we were able to tailor the training to the unique needs of the paraprofessional participants (e.g., Walker & Snell, 2017).

Improvements between the pre- and post-assessments in both skill areas suggested that the workshop training procedures were effective relative to *perceived* skill level and knowledge. However, a true assessment, through direct or virtual observation, of paraprofessional skill application would be important to consider in the training process. We were unable to measure improvements in skill implementation via observation due to time and practicality issues. Furthermore, paraprofessionals declined participation in voluntary coaching sessions. Coaching can be advantageous over stand-alone workshops that often times lack generalization from content knowledge to effective implementation (Hall, Grundon, Pope, & Romero, 2010). Coaching, which often relies on modeling, performance feedback, and accountability as daily classroom activities take place (Brock & Carter, 2015), may have enhanced the skill development and implementation fidelity of paraprofessionals in the current study and allowed for more objective measurement of skill application. Fortunately, we were able to evaluate the barriers to paraprofessionals' participation in coaching sessions through a social validity interview.

According to the social validity data, paraprofessional participants found that both the training procedures and recommended strategies were helpful; however, intervention implementation was not maintained over time. As mentioned earlier, coaching may have promoted continued implementation of such strategies. It was interesting that the

paraprofessionals found coaching to be potentially valuable but did not pursue it due to noted challenges during the focus group interviews (e.g., lack of consistency in teacher practices, influence of outside expert). In the future, it may be important to discuss the need for train-the-trainer models whereby the supervising teacher receives training from the outside expert and then coaches the paraprofessionals (e.g., Brock & Carter, 2016). This would be a more natural approach, which may potentially eliminate the challenges reported by paraprofessionals.

## Limitations and Future Research

There were several limitations in this study that could be improved upon in future studies. First, the assessments evaluated perceptions as opposed to objective measures of paraprofessional skill and knowledge. Additionally, because the paraprofessionals did not volunteer to participate in the coaching sessions, we were unable to determine whether paraprofessionals applied learned skills in the classrooms after workshop sessions. Future research should include measures of knowledge and skill application during both workshop and applied training sessions to ensure acceptable implementation fidelity and skill maintenance. Furthermore, it will be important to explore further the benefits of training supervisors (e.g., special educators) on coaching strategies for paraprofessional skill development, as this may address limitations associated with coaching delivered by outside experts (e.g., Brock, Biggs, Carter, Cattey, & Raley, 2015). Administrators should also consider such training practices when developing paraprofessional development plans. Researchers working with schools in rural areas must collaborate with administrators to develop effective training plans that reflect best practice but also those needs unique to rural special education providers. Ideally, teachers and paraprofessionals should receive training together or a train-the-trainer model could be enacted to ensure accuracy and accountability of skill implementation.

## Conclusion

Empowered and skilled paraprofessionals are key educational team members who contribute to positive student outcomes. In this study, we presented a process of facilitating paraprofessional development and evaluating workshop outcomes for a group of paraprofessionals educating students with severe disabilities in a rural special education school. Through sharing this process, we hope to provide guidelines for teachers and administrators who support paraprofessionals in fulfilling their valuable roles and responsibilities. The use of similar training approaches could support teachers and school districts in identifying areas for further knowledge and skill development for their paraprofessionals.

## References:

- Bondy, A. S., & Frost, L. A. (1994). The picture exchange communication system. *Focus on Autistic Behavior*, 9, 1-9.
- Brock, M. E., & Carter, E. W. (2016). Efficacy of teachers training paraprofessionals to implement peer support arrangements. *Exceptional Children*, 82, 345-371.
- Brock, M. E., Biggs, E. E., Carter, E. W., Cattey, G. N., & Raley, K. S. (2015). Implementation and generalization of peer support arrangements for students with severe disabilities in inclusive classrooms. *The Journal of Special Education*. Advance online publication. doi: 10.1177/0022466915594368

- Brock, M. E., & Carter, E. W. (2013). A systematic review of paraprofessional-delivered educational practices to improve outcomes for students with intellectual and developmental disabilities. *Research and Practice for Persons with Severe Disabilities*, 38, 211-221. doi: 10.1177/154079691303800401
- Brock, M. E., & Carter, E. W. (2015). Effects of a professional development package to prepare special education paraprofessionals to implement evidence-based practice. *The Journal of Special Education*, 49, 39-51. doi: 10.1177/0022466913501882
- Brown, F., McDonnell, J., & Snell, M. (2016). *Instruction of students with severe disabilities* (8th ed.). Upper Saddle River, NJ: Pearson Education.
- Brown, T. S., & Stanton-Chapman, T. L. (2017). Experiences of paraprofessionals in US preschool special education and general education classrooms. *Journal of Research in Special Educational Needs*, 17, 18-30. doi:10.1111/1471-3802.12095
- Carter, E., O'Rourke, L., Sisco, L. G., & Pelsue, D. (2009). Knowledge, responsibilities, and training needs of paraprofessionals in elementary and secondary schools. *Remedial and Special Education*, 30, 344–359. doi: 10.1177/0741932508324399
- Chopra, R., Banerjee, R., DiPalma, G., Merrill, L., & Ferguson, A. (2013). Colorado's model for preparing paraprofessionals for rural early intervention programs. *Rural Special Education Quarterly*, 32, 20-28.
- Chung, Y., & Douglas, K. H. (2015). A peer intervention package for students with autism spectrum disorders who use speech-generating devices. *Journal of Developmental and Physical Disabilities*, 27, 831-849. doi: 10.1007/s10882-015-9461-1
- Douglas, S. N. (2012). Teaching para-educators to support the communication of individuals who use augmentative and alternative communication: A literature review. *Current Issues in Education*, 15, 1-14.
- Douglas, S. N., Chapin, S. E., & Nolan, J. F. (2016). Special education teachers' experiences supporting and supervising para-educators: Implications for special and general education settings. *Teacher Education and Special Education*, 39(1), 60–74. doi: 10.1177/0888406415616443
- Fisher, M., & Pleasants, S. L. (2012). Roles, responsibilities, and concerns of para-educators: Findings from a statewide survey. *Remedial and Special Education*, 35, 287–297.
- Giangreco, M. F., Suter, J. C., & Doyle, M. B. (2010). Paraprofessionals in inclusive schools: A review of recent research. *Journal of Educational and Psychological Consultation*, 20, 41-57.
- Hall, L. J., Grunden, G. S., Pope, C., & Romero, A. B. (2010). Training paraprofessionals to use behavioral strategies when educating learners with autism spectrum disorders across environments. *Behavioral Interventions*, 25, 37–51. doi:10.1002/bin.294
- Meadan, H., Shelden, D. L., Appel, K., & DeGrazia, R. L. (2010). Developing long-term vision: A road map for students' future. *TEACHING Exceptional Children*, 43, 8-14.
- National Joint Committee for the Communicative Needs of Persons with Severe Disabilities (NJC). (1992). *Guidelines for meeting the communication needs of persons with severe disabilities* [Guidelines]. Available from <http://www.asha.org/njc>.
- O'Neill, R. E., Albin, R. W., Storey, K., Horner, R. H., & Sprague, J. R. (2014). *Functional assessment and program development for problem behavior: A practical handbook*. Nelson Education.
- Passaro, P. D., Pickett, A. L., Latham, G., & HongBo, W. (1994). The training and support needs of paraprofessionals in rural special education. *Rural Special Education Quarterly*, 13, 3-9.
- Pindiprolu, S. S., Peterson, S. M., & Berglof, H. (2007). School personnel's professional development needs and skill level with functional behavior assessments in ten Midwestern states in the United States: Analysis and issues.

## **Efficacy of Choice of Preferred Engagement Stimuli on Escape-Maintained Disruptive Behavior**

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### **Abstract**

*This study compared the efficacy of no choice and choice of preferred engagement stimuli to reduce escape-maintained disruptive behavior of pupils in kindergarten with developmental disabilities in inclusive classes. This study demonstrated how functional behavior assessment can be conducted in a school setting to determine the functional relationship between escape-maintained disruptive behavior and preferred engagement stimuli. The treatments were alternated. While both treatments were effective at reducing escape-maintained disruptive behavior, the results demonstrated a greater reduction with a choice of preferred engagement stimuli. The study extended the use of the choice of preferred engagement stimuli to young children and included an evaluation of the treatments via a social validity measure completed by the teachers.*

### **Introduction**

Disruptive behavior in young children with developmental disabilities is likely to interfere with the learning process and leads to acts of physical aggression (Kaiser & Rasminsky, 2012). These children are also likely to experience peer rejection and negative interaction with teachers (Dunlap et al., 2006). As a result, teachers frequently used consequence-focused procedures in their classrooms. These procedures could involve

reinforcement (e.g., the mystery motivator program and token system) or punishment (e.g., over-correction, extinction, and time-out (Alstot & Alstot, 2015).

Such procedures are often ineffective, as they are implemented subsequent to the occurrence of disruptive behavior. The effects of such procedures are limited, in that once the teacher stops using them, the disruptive behavior often returns (Shores, Gunter, & Jack, 1993). This is because they were not designed to target the function of disruptive behavior (Ingram, Lewis-Palmer, & Sugai, 2005).

Teachers began to employ function-based treatments, which identify the function that the disruptive behavior serves (Schlenker-Korb, 2014). These treatments have demonstrated considerable improvements in children's behavior (Nahgahgwon, 2008; Reeves, Umbreit, Ferro, & Liaupsin, 2013; Wood, Ferro, Umbreit, & Liaupsin, 2011). The treatments are based on the findings of a functional behavior assessment (FBA; Dunlap et al., 2006); this is a problem-solving process used to identify antecedent variables, which immediately precede disruptive behavior, and consequence variables, which immediately succeed such behavior (Sugai, Sprague, Horner, & Walker, 2000).

The FBA sequence for assessing these variables consists of indirect (e.g., record reviews and interviews) and direct descriptive assessments (e.g., scatter plots and direct observations) and experimental functional analysis, which systematically manipulates antecedent and consequent events to identify the hypothesis regarding the function of the disruptive behavior (Schlenker-Korb, 2014). Once FBA is conducted, a function-based treatment can be implemented to teach behaviors that replace or counteract this function, modify antecedent variables that reduce the likelihood of disruptive behavior, and provide consequence variables that increase the likelihood of replacement behaviors (Sugai et al., 2000).

Numerous reviewers of these treatments (Burton, 2012; Jolivette, Wehby, Canale, & Massey, 2001; Schlenker-Korb, 2014; Watanabe & Sturmey, 2003) have demonstrated the effectiveness of choice-making techniques. Offering a choice of preferred stimuli or activities to positively influence the behavior of children with disabilities has become a highly salient technique in behavioral function-based treatments (Burton, 2012; Schlenker-Korb, 2014).

Children choose from multiple activities or stimuli prior to completing a task (Burton, 2012; Schlenker-Korb, 2014). Young children with developmental disabilities can be taught to choose stimuli or activities that reinforce (Watanabe & Sturmey, 2003) replacement behaviors to motivate the children to engage in them (Jolivette et al., 2001). This may help the children to predict a sequence of environmental events (Jolivette et al., 2001), thereby decreasing their disruptive behaviors (Romaniuk et al., 2002). Offering a choice of preferred stimuli or activities may provide the children with opportunities for increased teacher-child interaction while engaging in replacement behaviors (Romaniuk et al., 2002).

However, the results of previous studies were mixed between offering a choice of preferred stimuli and obtaining the preferred stimuli itself. Other findings have raised doubts about the factors accountable for preferred behavior change (Parsons, Reid, Reynolds, & Bumgarner, 1990). It is unclear whether it is choice or obtaining the preferred stimulus that offers the greatest advantage and leads to behavior change in function-based treatments. Research examining the effects of choice and no choice of preferred stimuli during function-based treatments is limited.

The aim of this study was to extend the research concerning function-based treatments in two directions. First, we aimed to determine the effectiveness of preferred engagement stimuli in reducing escape-maintained disruptive behaviors of pupils in kindergarten with developmental disabilities in inclusive elementary classes. Second, we investigated the effectiveness of choice and no choice of preferred stimuli in reducing the occurrence of escape-maintained disruptive behaviors via function-based treatments.

## Method

### Participants and Setting

Four pupils in kindergarten were chosen based on the following criteria: (1) following an Individualized Education Plan (IEP), (2) independent confirmation of DSM-IV criteria by at least two professionals, (3) presence of disruptive behaviors that consistently impeded learning processes, (4) enrollment in the inclusive kindergarten class, (5) contact from the school to the child's parents regarding disruptive behavior at least four times in three weeks, (6) no self-injurious behavior, and (7) parental consent to participation prior to the study.

**Jaylynn.** Jaylynn was a 7-year-old girl diagnosed with Down's syndrome (DS) and mild intellectual disability (ID). She received individualized speech therapy for 1 hour three times per week. The class contained 20 students, a teacher, and an aide. The teacher had 12-years of teaching experience in inclusive kindergarten classes and limited experience in FBA. Jaylynn's disruptive behavior included knocking objects off surfaces, touching children sitting behind her, frequent pounding on the desk, and leaving the assigned area. Her teacher used time-out as behavioral management. Her treatment was conducted in math class whole-group activities.

**Marshall.** Marshall was a 6-year-old boy diagnosed with autism spectrum disorder (ASD). He received social skills therapy for 1 hour four times per week as part of a small group. The class contained 17 students, a teacher, and an aide. His teacher had 9 years of teaching experience in inclusive kindergarten classes and limited experience in FBA. Marshall's disruptive behaviors included pushing tasks away, calling out, and refusing to follow instructions. His teacher used a token economy system as behavioral management. His treatment was conducted in reading class small-group activities.

**Dylan.** Dylan was a 7-year-old boy diagnosed with mild cerebral palsy (CP) and mild ID. He received speech therapy for 90 min three times per week. The class contained 21 students, a teacher, and an aide. The teacher had 8-years' teaching experience in inclusive kindergarten classes and limited experience with FBA. Dylan's disruptive behaviors included leaving the assigned area, grunting, and screaming. His teacher used the mystery motivator program for behavioral management. His treatment was conducted in reading class whole-group activities.

**Ella.** Ella was a 6-year-old girl diagnosed with attention deficit hyperactivity disorder (ADHD) and Tourette's syndrome. She was not taking medication during the study, and received social skills therapy for 1 hour three times per week as part of a small group. The class contained 20 students, a teacher, and an aide. The teacher had 11 years' teaching experience in inclusive kindergarten classes and limited experience with FBA. Ella's disruptive behaviors included rocking in her chair, crying, pushing materials, and leaving the assigned area. Her teacher used the mystery motivator program as behavioral management. Her treatment was conducted in science class small-group activities.

### Functional Assessment Interview

Each teacher interviewed the parents of these subjects by using the Functional Assessment Interview (FAI) Form (O'Neill et al., 1997). The FAI is used to gather information about the history and description of disruptive behaviors, antecedent and consequent variables, setting events (i.e., medication, daily schedule, and sleep pattern), replacement behaviors, reinforcers (i.e., activities and stimuli), previous strategies, and communicative ability. Each interview was audio recorded. Following the FAI, a master's-level behavior analyst listened to the recording, determined the function of disruptive behavior, and rated it using a 5-point Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

The researcher then administered the FAI Form to each teacher to gather additional information. The researcher did not read or listen to the FAI responses from the other teachers' interviews with parents. Each interview was audio recorded. Subsequent to the FAIs, the behavior analyst listened to the recordings, determined the function of disruptive behavior, and rated it using the same scale.

### Direct Observation

During the study, teachers attended a 5 hour training workshop that included the provision of examples; modeling the correct operational definition of disruptive behaviors, replacement behaviors, specific antecedents, and specific consequences; identifying hypothesized functions via data source triangulation; using the Functional Analysis Observation (FAO) Form (O'Neill, Horner, Albin, Storey, & Sprague, 1990); and collecting data using event recording, which is a process used to document whether disruptive behavior occurred during a short observation period.

The behavior analyst also trained teachers to calculate conditional probabilities, which are determined by dividing the number of consequence and antecedent occurrences by the sum of the number of disruptive behavior occurrences and multiplying the result by 100. They also answered their questions and provided guidance and support as teachers observed and recorded descriptive behaviors, antecedents, and consequences during typical activities. Training continued until the teachers achieved 100% agreement for three consecutive sessions during naturally occurring activities.

Each teacher observed the subjects in seven 20-min sessions and continued observation until confidence in their ability to predict disruptive behavior was followed by a similar disruptive behavior pattern in the FAO form. The teachers then calculated the conditional probability of consequence and antecedent occurrences and interpreted the results independently to identify functions.

Using a video recording, the behavior analyst observed the subjects during the same observation period, recorded the consequences, antecedents, disruptive behaviors, and exact time on the FAO form, and calculated and interpreted the conditional probabilities to identify functions.

Inter-observer agreement (IOA) between the behavior analyst and each teacher was determined when they recorded the antecedents and consequences associated with a disruptive behavior independently within 10 seconds. IOA was calculated by dividing the number of agreements by the total number of disagreements and agreements.

### Results of Functional Assessment Interview and Direct Observation

During the FAI, the behavior analyst identified escape as the function of Jaylynn's disruptive behavior, with a confidence rating of 4 (*agree*). During the FAO, the teacher and behavior analyst determined that her disruptive behaviors were followed by escaping the demand of participating in math class during whole-group activities. The IOA on the FAOs was high (range: 98.5–100%; mean: 99.5%).

During the FAI, the behavior analyst identified escape as the function of Marshall's disruptive behavior, with a confidence rating of 5 (*strongly agree*). During the FAO, the teacher and behavior analyst determined that his disruptive behaviors were followed by escaping the demand of participating in reading class during small-group activities. The IOA on the FAOs was high (range: 99–100%; mean: 99.6%).

During the FAI, the behavior analyst identified escape as the function of Dylan's disruptive behavior, with a confidence rating of 5 (*strongly agree*). During the FAO, the teacher and behavior analyst determined that his disruptive behaviors were followed by escaping the demand of participating in reading class during whole-group activities. The IOA on the FAOs was high (range: 97–100%; mean: 98.3%).

During the FAI, the behavior analyst identified escape as the function of Ella's disruptive behavior, with a confidence rating of 4 (*agree*). During the FAO, the teacher and behavior analyst determined that her disruptive behaviors were followed by escaping the demand of participating in science class during small group activities. The IOA on the FAOs was high (range: 97.4–100%; mean: 98%).

### **Brief Multiple-Stimulus Preference Assessment**

Following direct observation, teachers attended a 2-h training workshop on conducting brief multiple-stimulus preference assessments (Carr, Nicolson, & Higbee, 2000) with the subjects to identify their six most preferred stimuli. The teachers assessed the subjects during three sessions.

They presented them with six stimuli (i.e., bingo, a maze, a coloring book, and jigsaw, crossword, and slider puzzles) selected from a reinforcer survey completed by the subjects' parents' and teachers. The teachers allowed the subjects to select the activity they most preferred. As the subjects chose a preferred stimulus, the teachers removed the chosen stimulus and did not replace it during the session. There was a 3-min break between sessions. The teachers calculated the number of times each preferred stimulus was selected.

Stimuli were ordered according to preference, from most to least preferred. Jaylynn selected bingo as her most preferred stimulus, followed by the maze, jigsaw puzzle, crossword puzzle, coloring book, and slider puzzles. Marshall selected the coloring book, followed by the jigsaw puzzle, maze, crossword puzzle, slider puzzles, and bingo. Dylan selected bingo, followed by the jigsaw puzzle, coloring book, slider puzzles, crossword puzzle, and maze. Ella selected the slider puzzles, followed by the jigsaw puzzle, coloring book, bingo, maze, and crossword puzzle.

### **Function-Based Treatment Design**

Following the stimulus choice assessment, teachers attended an 8-h training workshop on offering choice and no choice of preferred stimuli during function-based treatments, which included the provision of simulated examples; modeling the correct implementation of treatment; and collecting data using momentary time sampling to record naturally occurring activities. The behavior analyst trained the teachers to design function-based treatment, ignore the subjects' disruptive behaviors, redirect them to activities with minimal interaction, and remind them that they would receive their preferred engagement stimulus if they followed the classroom rules for 30 min during the activity. The rules, with pictures, were posted on a board at the front of the classroom. The behavior analyst also trained teachers to assess treatment integrity data using checklists and create multiple treatment reversal design graphs of the subjects' progress.

The behavior analyst answered questions and provided assistance as teachers implemented the treatments. The behavior analyst explicitly reviewed the treatments with teachers before each class. They also trained them to calculate percentages for the occurrence of disruptive behaviors and recorded disruptive behavior independently during training. The behavior analyst shared treatment integrity data with teachers to provide performance feedback. Training continued until IOA scores were 100% for three consecutive sessions.

A comparison between choice and no choice of preferred stimulus during function-based treatment was performed using a multiple treatment reversal design, which consisted of the following: (A) baseline, (B) choice of preferred stimulus, and (C) no choice of preferred stimulus. Choice and no choice of preferred stimulus were counterbalanced across the subjects to minimize threats to internal validity and multiple treatment interference. Teachers reminded the subjects of which treatment would be used each day to ensure that they could differentiate between the two treatments.

Data were collected using the momentary time sampling recording divided into 10-second intervals for 30-min sessions. Baseline, treatment, and maintenance data were collected during whole-group activities in math (Jaylynn) and reading (Dylan) classes and small-group activities in reading (Marshall) and science (Ella) classes.

### **Baseline Sessions**

Teachers led the typical activities. The treatment elements and preferred stimuli were not used during these sessions.

### **Choice Sessions (B)**

The teachers did not modify antecedent stimuli to reduce the likelihood of those stimuli occasioning disruptive behavior. The subjects chose one preferred stimulus at the beginning of each session. If they followed the rules, at the end of the session they received their selected stimulus, contingent on their use of the replacement behavior. Those who did not follow the rules were told that they would get another chance in the next session. Teachers initially ignored the subjects' disruptive behaviors (for at least 30 seconds). If they were disruptive for longer than 2 min, the teachers were trained to redirect children to the activity and remind them of the available rewards.

### **No-Choice Sessions (C)**

The teachers did not modify antecedent stimuli to reduce the likelihood of those stimuli occasioning disruptive behavior. The procedure for no-choice sessions was the same as that for choice sessions, but the teachers, rather than the kindergartners, chose one of the subjects' preferred stimuli.

### **Maintenance Sessions**

Phases that were more effective were implemented for three weeks at the end of the final phase; data were collected daily.

### **Inter-observer Agreement**

Using a real-time video cassette recorder, the behavior analyst recorded the disruptive behaviors and exact time for 70% of each phase. The behavior analyst then calculated IOA by dividing the number of agreements by the number of observed intervals and multiplying this by 100.

### **Treatment Integrity**

Teachers completed a checklist for all treatment and maintenance phases. The

behavior analyst completed the checklist for 70% of these phases and calculated treatment integrity by dividing the accurately completed elements by the total number of treatment elements and multiplying this by 100. Treatment integrity IOA was calculated by dividing the number of agreements by the total number of treatment elements and multiplying this by 100.

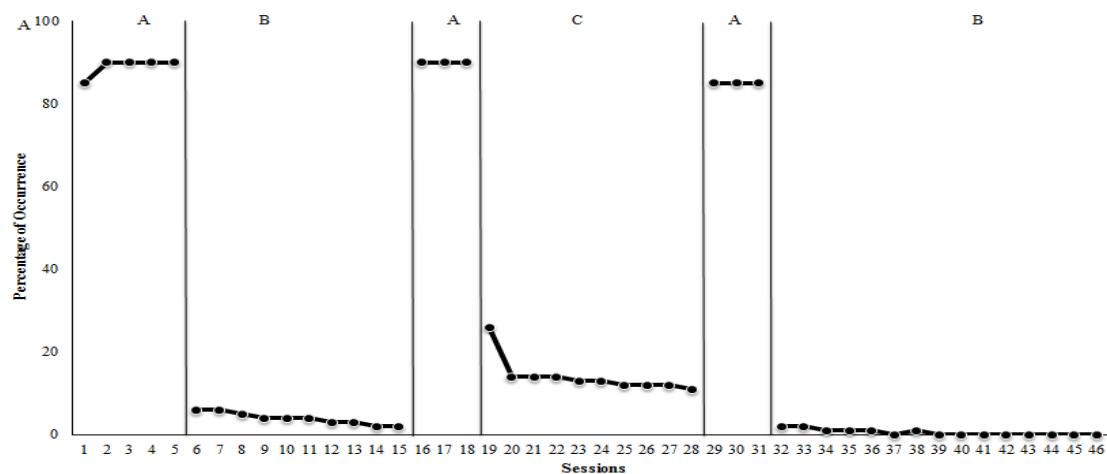
### Social Validity

After all sessions, teachers completed the Treatment Acceptability Rating Form-Revised (TARF-R; Reimers, Wacker, Cooper, & DeRaad, 1992) to assess treatment acceptability for the classes. The questionnaire consisted of 17 questions assessing each treatment's disruption/time required, side effects, effectiveness, willingness, cost, and reasonableness, responses for which were indicated on a 7-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The total score ranged from 17 to 119.

## Results

### Jaylynn

During five baseline sessions, Jaylynn's escape-maintained disruptive behavior averaged 89% (range 85–90%). When Treatment B was implemented for 10 sessions, her disruptive behavior decreased considerably to an average of 3.9% (range 2–6%). With a return to the baseline phase for three sessions, her disruptive behavior increased to levels similar to those of the first baseline measurement, with a mean of 90%. When Treatment C was implemented for 10 sessions, her disruptive behavior gradually decreased to 14.1% (range 11–26%). With a return to the baseline phase for three sessions, her disruptive behavior remained at an average of 85%. In the maintenance phase, her disruptive behavior decreased again to 0.53% (range 0–2%). The IOA for disruptive behavior was 100% for each phase. Treatment integrity IOA and average treatment integrity were 100% during the treatment and maintenance phases. Using the TARF-R, her teacher rated Treatment B at 119 and Treatment C at 110.

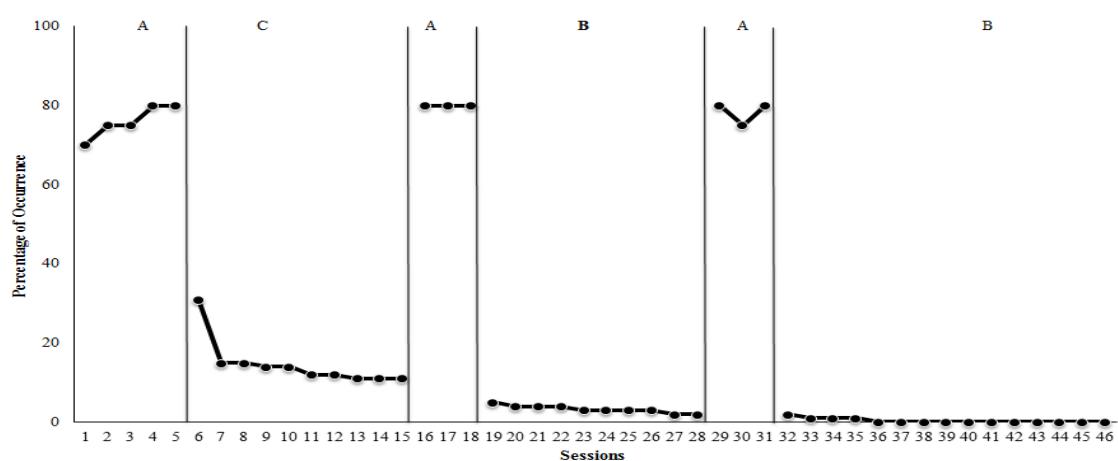


**Figure 1. Percentage of occurrence of disruptive behavior for Jaylynn during baseline, choice treatment, no choice treatment, and maintenance phases.**

### Marshall

During five baseline sessions, Marshall's escape-maintained disruptive behavior averaged 76% (range 70–80%). When Treatment C was implemented for 10 sessions, his disruptive

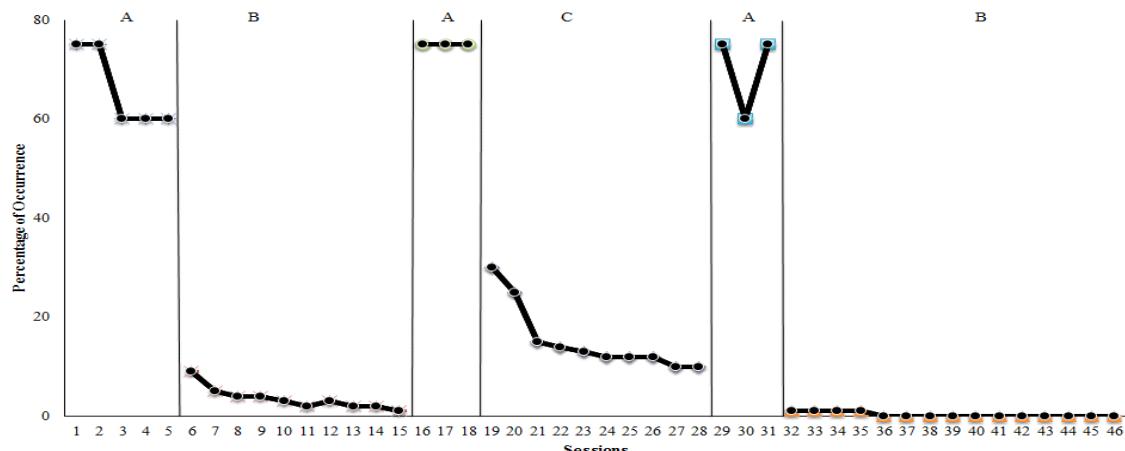
behavior decreased gradually to an average of 14.6% (range 11–31%). With a return to the baseline phase for three sessions, his disruptive behavior increased to levels similar to those of the first baseline measurement, with a mean of 80%. When Treatment B was implemented for 10 sessions, his disruptive behavior decreased considerably to 3.3% (range 2–5%). With a return to the baseline phase for three sessions, his disruptive behavior remained at an average of 78.33% (range 75–80%). In the maintenance phase, his disruptive behavior continued to decrease to 0.33% (range 0–2%). The IOA for disruptive behavior was 100% for each phase. Treatment integrity IOA and average treatment integrity were 100% during the treatment and maintenance phases. Using the TARF-R, his teacher rated Treatment B at 117 and Treatment C at 112.



**Figure 2. Percentage of occurrence of disruptive behavior for Marshall during baseline, choice treatment, no choice treatment, and maintenance phases.**

### Dylan

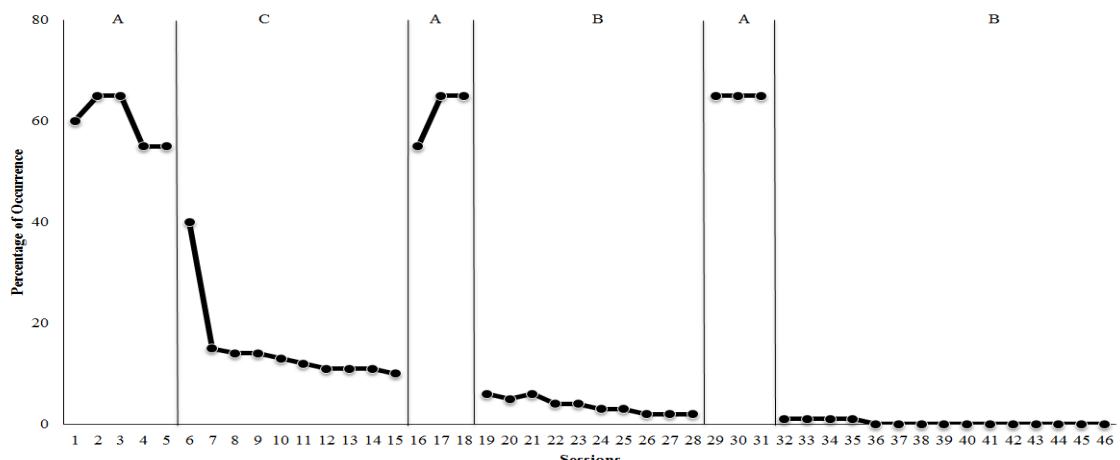
During five baseline sessions, Dylan's escape-maintained disruptive behavior averaged 66% (range 60–75%). When Treatment B was implemented for ten sessions, his disruptive behavior decreased considerably to 3.5% (range 1–9%). With a return to the baseline phase for three sessions, his disruptive behavior increased to levels similar to those of the first baseline measurement, with a mean of 75%. When Treatment C was implemented for 10 sessions, his disruptive behavior gradually decreased to 15.3% (range 10–30%). With a return to the baseline phase for three sessions, his disruptive behavior remained at an average of 70%. In the maintenance phase, his disruptive behavior decreased again to 0.27% (range 0–1%). The IOA for disruptive behavior was 100% for each phase. Treatment integrity IOA and average treatment integrity were 100% during the treatment and maintenance phases. Using the TARF-R, his teacher rated Treatment B at 118 and Treatment C at 109.



**Figure 3.** Percentage of occurrence of disruptive behavior for Dylan during baseline, choice treatment, no choice treatment, and maintenance phases.

### Ella

During five baseline sessions, Ella's escape-maintained disruptive behavior averaged 60% (range 55–65%). When Treatment C was implemented for 10 sessions, her disruptive behavior gradually decreased to 15.1% (range 40–10%). With a return to the baseline phase for three sessions, her disruptive behavior increased to levels similar to those of the first baseline measurement, with a mean of 61.7% (range 55–65%). When Treatment B was implemented for 10 sessions, her disruptive behavior decreased considerably to 3.7% (range 2–6%). With a return to the baseline phase for three sessions, her disruptive behavior remained at an average of 65%. In the maintenance phase, her disruptive behavior continued to decrease to 0.27% (range 0–1%). The IOA for disruptive behavior was 100% for each phase. Treatment integrity IOA and average treatment integrity were 100% during the treatment and maintenance phases. Using the TARF-R, her teacher rated Treatment B at 116 and Treatment C at 100.



**Figure 4.** Percentage of occurrence of disruptive behavior for Ella during baseline, choice treatment, no choice treatment, and maintenance phases.

### Discussion

The current study examined the effect of choice and no choice of preferred engagement stimuli on disruptive behavior exhibited by four subjects in kindergarten with developmental disabilities during function-based treatment and replicated and extended the findings of previous studies. The results of this investigation may expand our knowledge with

respect to whether choice or no choice of preferred engagement stimuli is most effective for subjects with developmental disabilities. Both the choice and no-choice phases were conducted in a counterbalanced manner across subjects to minimize treatment-order effects. Jaylynn and Dylan received the choice phase (B) first, whereas Marshall and Ella received the no-choice phase (C) first.

All subjects' disruptive behavior decreased in both the choice and no-choice phases, as evidenced by direct observation during an ongoing classroom routine. A decrease in disruptive behavior during both phases was observed for all subjects. This may have occurred due to positive reinforcement (i.e., via preferred engagement stimuli) contingent on replacement behaviors resulting in a reduction in escape-maintained disruptive behavior (Geiger, Carr, & LeBlanc, 2010), which counteracted the function of the behavior. When reinforcers that counteract the function of disruptive behavior are identified, function-based treatments can be designed to reduce the occurrence of that behavior.

However, Jaylynn and Dylan demonstrated reductions in disruptive behavior attempts when the choice phase was introduced. When the opportunity to choose was withdrawn in the no-choice phase, Jaylynn's and Dylan's levels of disruptive behavior increased in the first two to three sessions, and then decreased. When the choice phase was reintroduced for all subjects in the maintenance phase, they demonstrated the lowest levels of disruptive behavior.

The reduction of disruptive behavior differed between the two phases. There was a greater reduction in disruptive behavior in the choice sessions relative to that of the no-choice sessions. The opportunity to choose stimuli positively influenced disruptive behavior (Jolivette et al., 2001) of subjects in kindergarten with developmental disabilities. This may have occurred because the opportunity to choose may have provided positive reinforcement, increased the likelihood of replacement behavior, and decreased the likelihood of future disruptive behavior (Burton, 2012) in all of the subjects studied. Therefore, escape behavior was less valuable, as the subjects were offered their preferred stimuli. This is because gaining chosen stimuli decreased disruptive behaviors before the subjects attempted escape-maintained disruptive behavior at the beginning of each choice treatment session (May & Howe, 2013).

Brief multiple-stimulus preference assessment (Carr et al., 2000) was used to identify high- and low-preference engagement stimuli in natural ongoing activities. Relative to other types of assessment, this brief assessment was more time efficient and equally effective (Schlenker-Korb, 2014). The subjects' identification of preferences is consistent with findings from studies indicating that children with developmental disabilities are able to correctly identify their preferred stimuli (Parsons & Reid, 1990). In the current study, the brief assessment identified strongly preferred stimuli that impeded escape-maintained disruptive behavior.

Treatment integrity data for all choice and no-choice sessions demonstrated that they were all conducted with high fidelity. Treatment integrity results showed that appropriate administration of treatments was strongly correlated with a reduction in escape-maintained disruptive behaviors. Teachers could analyze behavior change via regular monitoring of treatment and disruptive behavior. Regular collection of treatment integrity data allowed teachers to assess the internal and external consistency of all phases easily (Gresham, Gansle, & Noell, 1993), as treatment was delivered over time (Horner et al., 2005).

Teachers rated the appropriateness, feasibility, and design of the choice and no-choice treatments for each subject. Using the TARF-R, teachers rated both treatments highly. However, they rated choice treatments as preferable and more socially valid, effective, and acceptable relative to no-choice treatment. The teachers were very willing to implement

choice of preferred engagement stimuli during maintenance phases and would continue to implement it throughout the year.

### Limitations and Future Research

This study was subject to several limitations. First, implementation of choice of preferred engagement stimuli was limited to four inclusive kindergarten classes. Therefore, the observed reduction in disruptive behavior may have been due to the characteristics of the classroom setting. Future research should replicate these results in dual environments, such as school and home (Dunlap et al., 2006), which could result in long-term behavior change. Second, FBA was used to verify the function of the subjects' disruptive behavior. However, even though the occurrence of escape-maintained disruptive behaviors decreased, the hypothesis concerning this function may have been inaccurate. Future studies conducted in school settings should replicate these findings using functional analysis to verify escape as a primary function of disruptive behaviors. Third, data were collected for only four subjects with different diagnoses displaying escape-maintained disruptive behavior; therefore, the generalizability of the results is limited. Future research focusing on the replication of this study with inclusion of different diagnoses and behaviors is required. Fourth, the brief multiple-stimulus preference assessment was conducted in only three sessions prior to administration of function-based treatments. Repeating assessment sessions during the study may be beneficial in determining whether children's engagement stimulus preferences changed (Burton, 2012). Future studies should replicate these findings to examine the possibility of changes in preference.

In conclusion, through the use of FBA, preference assessments, and function-based treatments, choice of preferred engagement stimuli appears to be effective in reducing escape-maintained disruptive behavior of pupils in kindergarten with developmental disabilities. As teachers in this study implemented choice of preferred engagement stimuli during naturally ongoing activities, early childhood teachers could prevent the occurrence of disruptive behavior via learning activities.

### References:

- Alstot, A. E., & Alstot, C. D. (2015). Behavior management: Examining the functions of behavior. *Journal of Physical Education, Recreation & Dance*, 86(2), 22–28.
- Boutot, A., & Hume, K. (2012). Beyond time out and table time: Today's applied behavior analysis for students with autism. *Education and Training in Autism and Developmental Disabilities*, 47(1), 23–38.
- Burton, B. N. (2012). *The effects of choice versus no-choice of task sequence on task engagement* (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses Global (Order No. 3534849). <http://search.proquest.com/docview/1277718400?accountid=142908>
- Carr, J. E., Nicolson, A. C., & Higbee, T. S. (2000). Evaluation of a brief multiple- stimulus preference assessment in a naturalistic context. *Journal of Applied Behavior Analysis*, 33(3), 353–357.
- Dunlap, G., Strain, P. S., Fox, L., Carta, J. J., Conroy, M., Smith, B. J., . . . Sowell, C. (2006). Prevention and intervention with young children's challenging behavior: Perspectives regarding current knowledge. *Behavioral Disorders*, 32(1), 29–45.
- Geiger, K. B., Carr, J. E., & LeBlanc, L. A. (2010). Function-based treatments for escape-maintained problem behavior: A treatment-selection model for practicing behavior analysts. *Behavior Analysis in Practice*, 3(1), 22–32.

- Gresham, F. M., Gansle, K. A., & Noell, G. H. (1993). Treatment integrity in applied behavior analysis with children. *Journal of Applied Behavioral Analysis*, 26(2), 257–263.
- Horner, R. H., Carr, E. G., Halle, J., McGee, G., Odom, S., & Wolery, M. (2005). The use of single-subject research to identify evidence-based practice in special education. *Exceptional Children*, 71(2), 165–179.
- Ingram, K., Lewis-Palmer, T., & Sugai, G. (2005). Function-based intervention planning: Comparing the effectiveness of FBA function-based and non-function-based intervention plans. *Journal of Positive Behavior Interventions*, 7(4), 224–236.
- Jolivette, K., Wehby, J. H., Canale, J., & Massey, N. G. (2001). Effects of choice-making opportunities on the behavior of students with emotional and behavioral disorders. *Behavioral Disorders*, 26(2), 131–145.
- Kaiser, B., & Rasminsky, J. (2012). *Challenging behavior: Understanding, preventing, and responding effectively* (3rd ed.). Boston, MA: Pearson Education.
- May, M. E., & Howe, A. P. (2013). Evaluating competing reinforcement contingencies on off-task behavior in a preschooler with intellectual disability: A data-based case study. *Education and Treatment of Children* 36(1), 97–109.
- Nahgahgwon, K. N. (2008). *Early intervention using function-based planning for children at-risk for emotional or behavioral disorders* (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses Global (Order No. 3297554), <http://ezproxy.emich.edu/login?url=http://search.proquest.com/docview/304685172?accountid=10650>
- O'Neill, R. E., Horner, R. H., Albin, R. W., Sprague, J. R., Storey, K., & Newton, J. S. (1997). *Functional assessment and program development for problem behavior: A practical handbook* (2nd ed.). Pacific Grove, CA: Brooks/Cole.
- O'Neill, R. E., Horner, R. H., Albin, R. W., Storey, K., & Sprague, J. (1990). *Functional analysis of problem behavior*. Sycamore, IL: Sycamore.
- Parsons, M.B. & Reid, D.H. (1990). Assessing food preferences among persons with profound mental retardation: Providing opportunities to make choices. *Journal of Applied Behavior Analysis*, 23(2), 183–195.
- Parsons, M. B., Reid, D. H., Reynolds, J., & Bumgarner, M. (1990). Effects of chosen versus assigned jobs on the work performance of persons with severe handicaps. *Journal of Applied Behavior Analysis*, 23(2), 253–258.
- Reeves, L. M., Umbreit, J., Ferro, J. B., & Liaupsin, C. J. (2013). Function-based intervention to support the inclusion of students with autism. *Education and Training in Autism and Developmental Disabilities*, 48(4), 379–391.
- Reimers, T., Wacker, D. P., Cooper, L., & DeRaad, A. O. (1992). Clinical evaluation of the variables associated with treatment acceptability and their relation to compliance. *Behavioral Disorders*, 18(1), 67–76.
- Romaniuk, C., Miltenberger, R., Conyers, C., Jenner, N., Jurgens, M., & Ringenberg, C. (2002). The influence of activity choice on problem behaviors maintained by escape versus attention. *Journal of Applied Behavior Analysis*, 35(4), 349–362.
- Schlenker-Korb, R. (2014). *Effects of choice and no choice of preferred engagement stimuli tasks on the off-task behavior of kindergarten students at risk for academic failure* (Thesis). Retrieved from ProQuest Dissertations & Theses Global (Order No. 1566982), <http://ezproxy.emich.edu/login?url=http://search.proquest.com/docview/1620353193?accountid=10650>
- Shores, R. E., Gunter, P. L., & Jack, S. L. (1993). Classroom management strategies: Are they setting events for coercion? *Behavioral Disorders*, 18(2), 92–102.

- Sugai, G., Sprague, J. R., Horner, R. H., & Walker, H. M. (2000). Preventing school violence: The use of office discipline referrals to assess and monitor school-wide discipline interventions. *Journal of Emotional and Behavioral Disorders*, 8(2), 94–102.
- Watanabe, M. & Sturmey, P. (2003). The effect of choice-making opportunities during activity schedules on task engagement of adults with autism. *Journal of Autism and Developmental Disorders*, 33(5), 535–538.
- Wood, B. K., Ferro, J. B., Umbreit, J., & Liaupsin, C. J. (2011). Addressing the challenging behavior of young children through systematic function-based intervention. *Topics in Early Childhood Special Education*, 30(4), 221–232.

## **The Role of Special Assistant Teacher to Help Special Needs Student through Instructional Interactions in an Inclusive Classroom**

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### **Abstract**

*This study aimed to determine the role of the special assistant teacher (SAT) compared to the general teacher as English teacher (ET) through instructional interactions in helping slow learner students (SLS) in the English lesson. Twenty-three grade 9 students were observed; interviews were also conducted with the two teachers and several students using semi-structured interview guides to determine types of instructional interactions and the role of SAT in helping SLS. Findings from this study indicated that both types of teachers engaged in academic and non-academic interaction with SLS during learning activities. In almost every learning activity, the role of the SAT to the SLS that, the SAT is more dominant than the ET in assisting the SLS. This dominance can lead to both dependence and independence of SLS toward SAT in learning activities.*

**Keywords:** *Instructional interactions, general teachers, special assistant teachers, slow learner students, inclusive classrooms.*

### **Introduction**

Inclusive education is one option for education that accepts the existence of differences and the abilities among children. Several conventions such as The World Conference on Special Needs Education, Salamanca Statement, and Framework for Action on Special Needs

Education have focused attention on the values contained in inclusive schools and created guidelines to implement inclusive education programs (Puri & Abraham, 2004). The goal is to provide classroom settings in which all students have challenges and opportunities and can successfully participate and learn (Tash, 2011).

Successful inclusive education practices have many aspects, one of which is the interaction between teachers and students. Recent studies focused on student-teacher interactions have shown that in successful inclusive environments, teachers may give greater attention to students with special needs compared to non-special needs students. (e.g, Kemp and Carter, 2002; Lee, Wehmeyer and Soukup et al, 2010; Nelson and Roberts, 2000; Cameron, 2014). The effectiveness of inclusive classrooms is also determined by instructional interaction patterns, the beliefs and attitudes of teachers towards students (Jordan & Stanovich, 2001), and intensive interaction (Ainscow, 2000; Daniels, 2000; Nind et al, 2003a; Kellet, 2004).

Interactions can be intensified by pairing adults with students with special needs to help the students overcome the difficulties associated with social interaction (Burdick & Theoharis, 2012). For example, the research shows the importance of teacher helpers in learning interactions in inclusive classes. The teacher helper (sometimes also referred to as paraprofessional, subprofessional, non-professional, educational aide, assistant teacher, assistant instructor, additional teacher, the assistant of schools, assistant technical, administrative aide, general aide, and assistant instructional) (Tanner, 1969) directly works with students with special needs. Use of paraprofessionals has increased (French, 2003; Giangreco & Broer, 2005), Research shows that teacher helpers have a positive impact on students (French & Pickett, 1997; Giangreco, Edelman, Broer, and Doyle, 2001), and providing increased and profits for students with special needs in terms of social advantage and academic students (Saddler, 2014). Assistant teachers increased the satisfaction and effectiveness of classroom teachers (Blatchford, Bassett, Brown, Martin, Russell and Webster, 2009a) as well as increased the motivation, attention and behavior of pupils (Howes, 2003). Besides helping students stay focused and follow orders, students' organization skills and ability to handle social behavior are fostered (Symes & Humphrey, 2011). This increases academic achievement and independence in the long term (Hamre & Pianta, 2001; Hughes & Kwok, 2007; Brown & McIntosh, 2012).

Since the initial implementation of inclusive education in Indonesia in 2002, it has faced various problems and obstacles, including inadequate infrastructure and funding, misunderstanding by teachers of procedures and services necessary for students with special needs, and a small number of teacher assistants and aides (Sunaryo, 2015). Up to now, inclusive education still has not been fully implemented in Indonesia, due to the unavailability of standard or special criteria for its implementation. Another obstacle is that educators are under-prepared to work with students with special needs: assistants are not proactive towards students and the division of tasks and roles between subject teachers and teacher assistants specialized in performing the task rarely involve discussion and models of collaborative learning (Irenewaty & Aman, 2015).

Yet the number of children in Indonesia with special needs is growing. In 2011, the number of children with special needs reached 9.9576 million children with category disabilities and 1.18556 million with special and gifted special intelligence (Empowerment Women and Child Protection Ministry of Republic of Indonesia, 2013) and approximately 14.1% being slow learners (Lisdiana, 2013). Without action on the part of the Education and Culture

Ministry of Republic of Indonesia, the participation of school children with special needs could become smaller, affecting the quality of education in Indonesia.

In Indonesia, slow learner students have distinctive characteristics: in addition to low intelligence, slow language learners have difficulty, often caused by poor socialization, in communicating either by presenting ideas or understanding conversations of others (Triani & Amir, 2013), and students who often have short attention spans and need adaptive learning materials (Slack & Boyer, 1964). This places additional responsibilities on the lead classroom teacher. It is very important that organizers of inclusive education facilitate the presence and involvement of teacher assistants to address learning interactions of students with special needs, including slow learner students.

This paper addresses one aspect of the implementing inclusive education in Indonesia. Through a single case study approach, this research focuses on the interaction between general teachers versus special teachers with slow learner students, especially in English lessons. In learning activities, some of the serious problems that occur in inclusive classrooms in Indonesia, among others, the lack of interaction between teachers and students with special needs, which is caused by the teachers do not understand the characteristics, abilities and needs of students with special needs, so the subject matter is difficult delivered well (personal communication, March 15, 2015). Learning method is less precise, lead no interaction between teacher-student (Aziz, Sugiman & Prabowo, 2015; Imanuddin, 2015). Interaction, in an inclusive classroom between teacher-student caused by lack of communication and only one way, use form of communication is not only verbal, but non-verbal as well as by students with special needs so that there is a misunderstanding between teachers and students (Fikariyanto, 2015). The results of recent studies against students with special needs stating that the teacher-student interaction is one of the problems encountered in class greatly affect student outcomes both short-term (behavioral), and long-term (academic and independence) (Hamre & Pianta, 2001; Hughes & Kwok, 2007), and the lack of awareness of teachers about the importance of interaction and the interaction patterns that will make a difference to students with special needs (Bouck 2006).

It examines the difficulties faced by in building effective instructional interactions with the slow learner student and special assistant teacher given teachers' own a lack of experience in dealing with slow learner students. Whereas, interactions between teacher-student, will have an impact on the learning process and outcome for students.

Another problem that arises is the assignment by general teachers of special assistant teacher to work with slow learner student such that the role of special assistant student is larger than the general teacher in learning activities.

Given the importance of instructional interaction for a slow learner student in understanding the subject matter and social development and the absence of recent research on the interaction of slow learner student, the research question are formulated as follows:

1. What kind of interactions occurred between English teacher (ET) and slow learner student (SLS) compared to the interaction between the special assistant teacher (SAT) and slow learner student (SLS) of English lesson?
2. How does the role of SAT -- compared with the ET in instructional interactions with the SLS?

## Literature Review

### Instructional Interaction

Robinson (2005) states that interaction is a reciprocal activity that can be verbal or non-verbal (Wang, 2014). Interactive communication is indicated by touch, proximity, eye contact, the expressive form of the face, movement, posture, depending on environmental factors as well as the time required. Interaction is the responses of others that shape and guide the response of every person in the interaction process (Hargie, 2006). Part of the act of reciprocity in working together is being committed to express a particular action (Wiberg, 2005). Sardiman (2014) stated that the particular instructional interaction is the basis for communicating knowledge, skills, and values between teachers with learners in learning activities. Learners must actively work with the pedagogical resources (Olofson, Lindberg, 2012). Classroom interaction patterns typically form a pattern of the initiation, response, evaluation (IRE) (Powell & Caseau, 2004) or initiation-response and follow-up (IRF) (Cazden, 2001). Effective classroom interaction between teachers and students is closely linked to a shared understanding in an activity (Kugelmass, 2004). Interaction approaches that can be done in an inclusive classroom can be competitive and cooperative (McLeskey & Waldron, 2000).

### General Teachers and Special Assistant Teachers

Definition of general teachers in Indonesia, from Education and Culture Ministry of The Republic of Indonesia, in the general guidelines of the implementation of inclusive education (2011) as the teachers who teach a subject that has been determined in accordance with their competence and who has the task of creating a comfortable learning environment for all students, creating and carrying out assessments on all the students to determine the ability of the needs, preparing an Individualized Educational Plan (IEP) with the teachers, and providing remedial special assistants to the students.

The same general guidelines define special assistant teachers as the teachers who have competence at least at the undergraduate level in special education, or teachers who have exceptional education special education qualification of special education in accordance with the requirements of the profession and who serve as a support to general teachers in providing special education services and compensatory interventions according to the needs of learners with special needs in inclusive schools.

In other terms, a special assistant teacher has designation or definition as teacher aides who are very supportive in helping students with disabilities in inclusive education (Calder & Grieve, 2004; Forlin, 2000; Giangreco, 2003a; Giangreco, Edelman, & Broer, 2001; McNally, Cole, & Waugh, 2001; Sorsby, 2004; Taconis, van der Plas, & Van der Sanden, 2004; Westwood & Graham, 2003; Wilkins, 2002; Woods, Wyatt Smith, & Elkins, 2005), and are increasing in number (Pearson, Chambers, & Hall, 2003; Kingsbury, 2005; Bourke & Carrington, 2007). Assistant teachers are indispensable in inclusive classrooms that aim to facilitate the learning process in the classroom, especially for students with special needs (Hasan, Hussain, Parveen & Souza, 2015). The task of a teacher's assistant or para-educator is to assist students in various subjects, including social and life skills, mathematics, language arts, reading, health, and writing (Mclachlan, 2014). Paraprofessionals have the task of providing support and improving access to the curriculum (Burdick & Theoharis, 2012).

## **Slow Learner Students**

Slow learner students are the students who have been left behind or students with special needs when learning expectations are not compliant with their capabilities (Chauhan, 2011) or the level of achievement equal to their low IQ (Krishnakumar et al., 2006). The definition of a slow learner is a student with an IQ below the average score of 100 but still above the threshold of students with intellectual disabilities as defined by an IQ of 70 (Shaw, 2010). A slow learning child is a child who struggles to learn because of a shortage of psychological and cognitive abilities (Cooter and Cooter Jr., 2004). According to Puri and Abraham (2004), a slow learner struggles with apprehending ideas because of limitations to inductive and deductive reasoning resulting from a decreased ability to formulate general conclusions. These children may experience challenges with social adaptation and participation. Consequently, they may also experience stress and related emotional problems.

In Indonesia, the definition of slow learner according the guidelines of the Organizers of Inclusion Directorate or PSLB (2004) is a child who has the intellectual potential slightly below normal but not including mental retardation and who typically has barriers or delays in thinking, stimulation, and social adaptation -- but still much better compared with the mentally disabled, but slower than normal, take a long time and require repetitions of academic and non-academic tasks. This definition is also confirmed by the Center for Curriculum Research and Teaching Ministry of National Education of Indonesia (2007): the slow learner is a child who has limitations in terms of intelligence potential, resulting in a sluggish learning process.

## **Inclusive Classrooms**

In an inclusive classroom, children learn together with the active involvement of those learning and teaching (McLeskey & Waldron, 2000). The purpose is the participation of all students regardless of disability, academic level, behavior, learning style, and strengths and weaknesses (D'Amico & Gallaway, 2010). Classes are structured to accommodate diversity in learning and behavior of all children including the children with special needs, and to foster academic achievement and social success for all (Kugelmass, 2004). According Sapon and Shevin (2007), an inclusive classroom is a great place to establish rules and practices on the basis that all people need to support and respect each other.

The Indonesian government, through the Ministry of Education and Culture in its general guidelines for the implementation of inclusive education (2011), committed to creating inclusive classrooms that have a good atmosphere that accepts diversity, respects differences, and can accommodate the heterogeneity of special needs students. Thus, there are several types of inclusive classrooms, namely: full regular classroom (students with special needs learn together with regular students), regular classes with a special assistant teacher (special needs students, accompanied by a special assistant teacher studying along with regular students) and special classes in regular schools (students with special needs separated from regular students, but at a certain moment included together).

## **Methods**

The approach used in this study is a qualitative approach to a single case study. Single case study research methods have been used in a variety of disciplines, especially psychology, special education, school psychology, and physical therapy in which they are used to determine the effects of planned interventions (Dattilo & Rusch, 2015). A single case study is effective for research that includes special needs because it is focused on the individual and

the data obtained can be a life experience (Horner et al, 2005). Researchers use the special education single case research method because it allows a small numbers of participants (3--10 people) (Kennedy, 2005) and because the method can track changes in individuals and organizations over time and respond to changes in their environment (Cardon & Wilcox, 2011). It has been used for teacher-initiated action research in the school; investigation of an intervention could be conducted by individual teachers according to the needs of their students (Horner et al, 2005; Kazdin 2011; Kennedy, 2005).

This single case study focuses on interactions between an English teacher and one student with special needs (namely a slow learner) and a special assistant during English lessons over one four-month semester. The research describes the meaning of interactions that occur in the process of learning of English between both teachers with the slow learner student. This research was conducted through observation, photographs, and interviews. Observation was conducted of the interactions between teachers and the special needs student while learning in the ongoing classroom. Photography was conducted by taking photos when all were interacting. Interviews were administered to all participants, both teachers and student with special needs, using a semi-structured interview that drew from an interview protocol that had been prepared, but also customized to context. The credibility of the study was improved by triangulating data by interviewing several sources related to the topic of study such as experts on the inclusive classroom, instruction, and English language, as well as by completing a checklist paper about all activities occurred in the classroom for all participants involved in the research to obtain accurate data. Analysis will be presented both as descriptive statistics on the interactions and by descriptive analyses that allow the results to be expressed qualitatively.

## **Participants**

Participants involved in the study came from an inclusive Islamic Junior High School in West Java, Indonesia. There was a total of 23 students (14 male, nine female) in ninth grade, of whom 22 exhibit typical student development (non-special students) and one is identified as a student with special needs. The student with special needs had been placed in the inclusive classroom during English lessons. This student is categorized as slow learner student whose special characteristics include an IQ around 75 - 90, low academic motivation, and according to the report of the psychologist, low focus on classroom activities. The teachers included are an English teacher (ET) and a special assistant teacher (SAT). The roles of the staff are differentiated. The English teacher is a primary teacher who teaches English language content, while the special assistant teacher who assists the English teacher with the student with special needs.

## **Setting and Materials**

Since its establishment in 2007, Islamic Junior High School in Depok, the school has graduated students six times. This is a private school with adequate facilities as well as good support as an inclusive school. Every new academic year, the school receives two classes, each of which includes at least one student with special needs. This study focuses on, a class using the moving class system, moving from one classroom to another in accordance with the subjects that have been prepared by the management of the school to provide opportunities for all students and not allow them to get bored in learning. Each classroom is equipped with a projector and computer, whiteboard, chairs and desks for each student. The lesson observed was a ninth-grade English class English class. Lessons usually have a duration of 1.5 - 2 hours. English teacher will work well in all classes, small groups and individuals. The

material used in this study is the English textbooks, teacher-made worksheets, exercise books and various Internet resources used over one semester according to the lesson plan created by the English teacher. The contents of the lessons to be learned is about recontext, narrative text, procedure, descriptive text, and a report in the day-to-day context. The special assistant teacher also made IEP outlines of the achievements that the slow learner student should accomplish. Topic or subject matter that was done by the slow learner student is the same as regular students, with a lowered difficulty level according to the abilities of the student.

## **Data Collection**

The researcher is the primary instrument in this study. Data collection included techniques observation, interviews, and photography. Observations were conducted to document the interaction between ET and SAT with SLS by observing the actions of teachers and reciprocal actions of students during the learning process. Face-to-face interviews were conducted between the researcher and the informants. The topic of these interviews was the interaction that occurs in the classroom during the learning process. Primary data for this study consisted of video and audio recording, especially recording learning interaction between ET or SAT with SLS. Teacher - student was interaction recorded using a video camera and a voice recorder. One camera was always be in the classrooms to observe learning activities involving teachers and students. Another camera followed teachers and students and an audio recording devices will followed the SLS. There were 14 total observation and a total of around 21 hours observed with recording process done for 1.5 to 2 hours during the classroom learning process for two meetings per week. The researcher selected only 12 observations out of 14 observations as data to be analyzed on the basis that these twelve complied the participants who involved in the instructional process in every class meeting. As for the rest, if there was one participant who was not present (e.g., the absence of the SAT in the classroom), the data is used as additional data. The results of this recording were transcribed to be used for more detailed data analysis.

## **Data Analysis**

During the implementation phase of the data analysis, researcher used Classroom Discourse Analysis, which examines the use of language in the context of the classroom understand the context and interplay improving classroom interaction; so as to obtain positive results and reduce factors inhibiting the participation of all students both classroom and outside learning (Rymes, 2008). Prior to the data analysis, coding categorization for a better understanding of the semantic content of utterances; the functions of the original data are grouped to allow researchers to determine the type of interaction occurring. The entire teacher - student interaction has been distributed into several categories and then the type of academic or non-academic interaction is determined. Academic interactions focus on lesson-related topics, while non-academic interactions include dialogues between teacher and student relating to managerial, status, and personal topic. Frequencies will be calculated as a percentage to see the interaction of the most widely appearing in the learning, learning to see the initiation of early initiation of interaction and interaction patterns to see the initiation forms of interaction (statements and questions), which gives effect to the understanding of the subject matter for students slow learner.

## Results

After coding and analysis process the data obtained is as follows:

**Table 1. Learning Interactions between ET with SLS**

Code	Category	Descriptions	Kind of Interaction
I-GSA-01	Interaction of ET and SLS to discuss problems or tasks together	<ul style="list-style-type: none"> <li>- ET asks about the purpose of the task</li> <li>- ET asks about the content of the material</li> <li>- SLS practices saying the name of the year</li> <li>- ET asks the SLS to answer questions</li> <li>- ET asks the meaning of a word</li> <li>- ET asks SLS to tell the story</li> <li>- ET ask about the content of the novel</li> </ul>	Academic
I-GSA-02	Interaction when SLS asks the ET for clarification	<ul style="list-style-type: none"> <li>- Asked about the meaning of words</li> <li>- Inquire about the objectives of the activity</li> <li>- Ask about grammar</li> </ul>	Academic
I-GSA-03	Interaction of ET to provide motivation	<ul style="list-style-type: none"> <li>- Providing advice and spirit</li> </ul>	Non Academic

In Table 1, the interactions that occurred between ET and SLS were on learning English. For the category of interaction that emerged after a coding, there are three categories and two types of interactions: academic and non-academic interactions.

**Table 2. Categories and Types of Learning Interaction between SAT and SLS**

Code	Category	Descriptions	Kind of Interaction
I-GPKA-01	Interaction SAT describing the task	<ul style="list-style-type: none"> <li>- SLS request listening task information and to write down the assignment information about the text from ET</li> <li>- Requests SLS to interpret some words</li> <li>- Asks the SLS to make a the short story</li> <li>- The SLS was asking the other students to work on the task about reorientation</li> <li>- Asks students to select one novel</li> <li>- Asks students to collaborate with each other</li> </ul>	Academic
I-GPKA-02	Interaction between SAT and SLS to complete tasks	<ul style="list-style-type: none"> <li>- SAT asks about the meaning of the sentence</li> <li>- SAT asks about the type of transport</li> <li>- SAT asks about the pronunciations of numbers and years</li> <li>- SAT asks student to tell about holiday experience</li> <li>- SAT asks the students to work on the in textbooks question</li> <li>- SAT asks student to make sentences</li> <li>- SAT asks the student to understand from the novel</li> <li>- SAT asks about the characters in the novel</li> </ul>	Academic
I-GPKA-	Interaction when SLS	- Asks about the use of the word	Academic

03	asked for an explanation from SAT	- Asks the meaning of the word - Asks about information on food packaging - Asks about the pronunciation of numbers and years - Asks about how to do the text organization task	
I-GPKA-04	Interaction when SAT gives motivation	- Provides a passion to search for information - Providing the spirit to not be afraid of wrong - Provide a spirit to keep trying	Non Academic
I-GPKA-05	Interaction of SAT to reminding SLS to stay focused	- Focuses on pronouncing numbers and years - Focuses on looking up a word. - Focus on translating words	Non Academic
I-GPKA-05	Personal interaction	- Reminds SLS not annoy another student	Non Academic

Table 2 obtained some results on the interactions that occur between the SAT and SLS on learning English. After coding, there are six categories and three different types of academic interactions and 3 non-academic interactions emerged.

A comparison of the two tables above shows that the more interaction types, both academic and non-academic is more occurred, between the SAT and SLS when compared to the ET and SLS. The frequency and percentage in each category of learning interaction is shown in more detail below.”

**Table 3. Initiation, Frequency, and Percentage between ET and SLS**

Type of interaction	Descriptions	Initiation of Interaction	Interaction occurred
			f
Discussing problems	- Asking about the purpose of the task - Asking about the content of the material - Practicing saying the name of the years - Asking the SLS to answer questions - Asking the meaning of the word - Asking SLS to tell the story - Asking about the content of the novel	ET ET SLS ET ET ET ET	1 8 1 1 5 2 2
Clarification	- Asking about the meaning of words - Inquiring about the objectives of the activity - Asking about grammar	SLS SLS SLS	3 1 2
Giving motivation	Providing advice and spirit	ET	5
Total			31
<i>Total initiation percentage between ET and SLS</i>			

Table 3 summarizes the 31 interactions occurring between the ET and SLS. The most frequent interaction in this category was to ask about the content of the material as many as eight or 25.8%, which was initiated by ET asking the SLS. When the interaction called for an

explanation by the SLS to the ET, the most common type was asking about the meaning of the word, as many as three times or 9.7%. The ET provided advice and encouragement as many as five times or 16.1%.

**Table 4. Initiation, Frequency, and Percentage of Interactions between SAT with SLS**

Type of interaction	Descriptions	Initiation of interaction	Interaction occurred	
			f	%
Describing tasks	- SLS requests for the assignment information from the ET to be written down	SAT	1	0.9
	- Requests SLS to interpret some words	SAT	6	5.2
	- Asks the SLS to make a the short story	SAT	3	2.6
	- Asks the students to work on the task about reorientation	SAT	5	4.3
	- Asks students to select one novel	SAT	1	0.9
	- Asks students to collaborate with each other	SAT	6	5.2
Completing tasks	- Asks about the meaning of a word	SAT	9	7.7
	- Asks about the type of transport	SAT	3	2.6
	- Asks about the pronunciations of numbers and years	SAT	7	6.0
	- Asks students to tell about the holiday experience	SAT	4	3.4
	- Asks the students to work on the textbook question	SAT	3	2.6
	- Asks the students to make sentences	SAT	4	3.4
	- Asks the students to understand the novel	SAT	4	3.4
	- Asks about the characters in the novel	SAT	5	4.3
Giving explanation	- Asks about the use of a word	SLS	6	5.2
	- Asks the meaning of a word	SLS	10	8.6
	- Asks about information on food packaging	SLS	3	2.6
	- Asks about the pronunciation of numbers and years	SLS	3	2.6
	- Asks how to do the task of text organization	SLS	2	1.8
Give motivation	- Provides a passion to search for information	SAT	4	3.4
	- Provides the spirit to not be afraid of being wrong	SAT	2	1.8
	- Provides a spirit to keep trying	SAT	6	5.2
Reminders to stay focused	- Focuses on pronouncing numbers and years	SAT	3	2.6
	- Focus on looking up the word	SAT	5	4.3
	- The focuses on in translating words	SAT	7	6.0
Personal	- Reminds SLS not to annoy another student	SAT	4	3.4
Total			116	100.0
<i>Total initiation percentage between SAT and SLS</i>				<i>78.91</i>

The interviews reveal that the ET geared learning interactions with the SLS toward task description, simple questions, and brief explanations. If the class was too busy and needed more attention, then usually the ET immediately asked the SAT to handle the SLS in order to provide a more detailed explanation.

Table 4 categorizes 116 interactions between SAT and SLS. The most common interaction in the category of the SAT explaining tasks to the SLS was when the teacher asked the student

to interpret words six times or 5.2%; in the category of SAT and SLS completing tasks together, the most interaction was searching for the meaning of the word nine times or 7.7%, initiated by the SAT asking the SLS. In the category of the SLS asking for explanations from the SAT, the most common interaction was asking about the meaning of a word, which occurred 10 times or 8.6%; in the interaction category of the SAT providing motivation to the SLS, the most interaction was encouragement to keep trying, which occurred. In the most interaction occurs is the interaction of encouragement to keep trying to SLS times or 5.2%. In the category of the SAT reminding the SLS to maintain focus, the most common interaction was a reminder to focus on translating a word, which occurred seven times or 6.0%, while the category of personal interaction, the SAT reminded the SLS not bother another student four times or 3.4%. In total, interaction between the SAT and SLS exceeded that between the ET and the SLS, representing 78.91% of total interactions, meanwhile ET and SLS only 21.09%.

Interviews conducted with SAT found that when SLS had difficulty understanding something, such as the meaning of a word, or sentence, SAT usually fished with simple questions first so that SLS could think more deeply while still being directed in accordance with the material being studied. That is, the SAT always tried to make the SLS think of the subject matter without directly informing the answer. In addition, SAT provided the opportunity for the SLS to ask other students if in this case SAT has not understood the task or material being studied.

**Table 5. Initiation and Interaction Pattern between ET and SLS**

Initiation of interactions	Pattern of interactions	Form of interactions	f	Total of initiation of interaction (%)
<b>By ET to SLS</b>	Initiation, response, follow-up	Statements (information sentence)	9	17.01
	Initiation, response, follow-up	Questions (question sentence)	16	
<i>Total of initiation of interactions by ET to SLS</i>			25	
<b>By SLS to ET</b>	Initiation, response	Questions (question sentence)	6	4.08
<i>Total of initiation of interactions by ET to SLS</i>			6	
Total interaction between ET with SLS			31	21.09

In table 5, interaction initiation was most often performed by ET to the SLS at 25 times or around 17.01% in the pattern initiation, response, follow-up: initiation forms in sentences questions to the SLS, then responded by SLS and follow-up in the form of answers to the SLS.

**Table 6. Initiation and Interaction Patterns between SAT and SLS**

Initiation of interactions	Pattern of interactions	Form of interactions	f	Total of initiation of interaction (%)
<b>By SAT to SLS</b>	Initiation, response, follow-up	Statement-question (information sentence);	68	62.59
	Initiation, response, follow-up	question-statement (question sentence)	24	
<i>Total of initiation of interactions by SAT to SLS</i>			92	
<b>By SLS to SAT</b>	Initiation, response	Questions (question - sentence)	24	16.32
<i>Total of initiation of interactions by SLS to SAT</i>			24	
Total of interaction between SAT with SLS			116	78.91

In Table 6, interaction initiation was most often performed by the SAT to the SLS, which occurred 92 times or around 62.59% with the pattern of initiation, response, follow-up. That is, the SAT initiated the interaction through question sentences to the SLS, the SLS responded, and then the SAT followed up in the form of answers to the SLS.

Comparing Tables 5 and 6, SAT more often initiated interactions with the SLS, 62.59% compared to initiation by the ET. While, the interaction initiation was often performed by SLS to SAT than SLS to ET which occurred 24 times or around 16.32%.

### Discussion

The role of this study is to examine role of the SAT in helping the SLS compared with ET and SLS from some kind of interactions of English lesson by linking it to the interactions in the activity of learning of English lesson which a dynamic process between teachers and students.

Regarding the first research question, about the types of interactions that occur between the ET and SLS compared to the both academic and non-academic interactions occurred, both of which occurred more frequently between the SAT and SLS. The reason is closely connected to the classroom tasks of both teachers and students' the understanding of slow learner characteristics by students. First, As a primary teacher, the ET has the responsibility to manage the classes including accommodating the needs of every student in apprehending the lesson material according to their individual ability. ET must ensure that all students understand the material being studied, although not all students are accommodated, including SLS. Limited time, the difference of speed among students in understanding the subject matter, and less conducive classroom settings are conditions that often occur in the learning

process and that affect the attention and focus of the ET on the SLS so that interactions occur less frequently between the ET and SLS versus the SAT and SLS.

For instance, this can be seen at the beginning of the learning activity when the ET explains the subject matter in the classical, followed by an explanation on an individually who do not understand one by one. The SLS usually gets for a detailed explanation from the SAT. This condition affects the quality of interaction, especially understanding of the subject matter by the SLS. The ET realizes that detailed explanations necessary to convey material properly to the SLS take time and special attention. Yet as the primary teacher in the classroom, ET must also pay attention to general students (GS) in addition to the SLS. This condition is instead the task of the SAT as a teacher who helps general teachers in addressing to SLS. Likewise, non-academic interactions involving, motivation and a warnings to focus are most often carried out by the SAT rather than the ET. Thus, academic and non-academic interactions that take time or special attention are still provided to the SLS.

In addition, the understanding by the ET of characteristics and learning styles typical of the SLS, is still less than that of the SAT who spend every moment along with the SLS in learning activities and outside learning activities. Provision of aid and attention by the SAT to the SLS is based on the learning characteristics of the SLS, which require concrete explanations, slow explanations of even very simple things, adequate time to practice new tasks, and compensation for low academic motivation and focus on the subject matter being studied. This is in line with Shaw (2010), who claims that slow learner students have the following characteristics: their performance is better when they receive concrete rather than abstract explanations, it is difficult to apply the concept to the new situation, it is cognitively difficult for them to match new information, they require extra time for practice and careful time management, require more time in practice, as well as having low academic motivation. Based on these characteristics of SLS, then the task of the SAT as a teacher who helps the ET, there will be more interaction with SLS.

The SAT interacted with the SLS 116 times or 78.91% and while the ET interacted with the SLS 31 times or 21.09%, signifying that the SAT is dominant in handling the SLS compared to the ET. Attention and focus should be shared for all students, providing less space and time for the ET to provide in-depth explanations and academic motivation to SLS, so this is mostly done by the SAT. In addition, because of typical SLS characteristics, they not only require the attention of teachers, but also need encouragement to develop a desire to learn, shown by the initiation to conduct learning activities. This underlies the role of teachers, both ET and SAT when assisting the SLS in learning activities.

The second research question regards the role of the SAT compared to that of the ET in instructional interactions with the SLS; in addition to the previous analysis of frequencies and percentages, more detail can be seen in the initiation interaction and patterns of interaction that occur between teachers and student. This comparison reveals that the SAT more often initiated interaction with the SLS. The form of initiation statement made by the SAT is intended to ensure that the SLS understands the material that was submitted and has time to prepare an exercise if needed. Some reasons for this initiation is done by SAT because it is associated with the initiation to perform an activity. The SLS tends not or conduct any activities from the beginning of the learning process-usually just sitting down, paying attention to other students, day dreaming, or even slightly disturbing other students. Thus, the SLS needs to be kept to task by the SAT. Initiation of interactions by the ET usually occurred over subject matter elusive to the SLS, such as the meaning of English words. The form of

interaction initiations was dominated by the question, indicating that, through a question given at the beginning, the ET quickly determined the extent to which the SLS understood the material and could then answer quickly. This is associated with the distribution of time and attention by the ET should be given to the GS. Interactions with both teachers show that the SAT more often initiated interactions with rather than ET. Clearly, the SLS was more comfortable asking the SAT for help or clarification, although the SLS also requested assistance from the ET regarding the meaning of words.

The pattern that occurred between the SAT or ET and the SLS shows the results of these interaction initiations: the same interaction pattern occurred regardless of which teacher was involved. The pattern of initiation, response, and follow-up - either in the form of statement or question initiation - indicates that both the ET and the SAT initiated, followed by listening to the answers of the SLS and then providing an explanation. There are, however, differences in the interaction patterns in the statements and questions between the SAT and ET. If the ET starts the interaction with SLS in the form of a sentence statement or information, indicating that the ET does not have sufficient time to explain in detail about the matter to the SLS even after the sentence statement is followed by short questions regarding the aspect that is not understood by the SLS, there is a tendency toward questions given in the form of short interrogative sentences that go straight to answers that the SLS can instantly understand. Otherwise, if the initial interaction is in the form of a question sentence, this implies that the ET has enough time to explain the material to the SLS, albeit possibly without much detail.

In contrast to the ET, the SAS usually began interactions with the SLS with the statement, followed by questions to the SAT as a way to know whether the SLS understand the intent of the statement. According to the SAT, this practice is intended to make the SLS practice critical thinking. Likewise, if the initial interaction is in the form of a question, it will be followed a statement that gives affirmation to SLS in order to better understand the material that was submitted. Explanations are important for improving the academic ability of the SLS. Differences arising from the initial question given by the SLS to the ET will usually be answered directly by ET so that the SLS directly can quickly understand the material, questions directed to the SAT by the SLS, besides being given an explanation are usually followed the question feedback from the SAT to the SLS that aims provide practice for the SLS in applying thought to the material. These interaction patterns reflect the role of the ET and SAT.

The frequency, percentage, interaction initiation and interaction patterns quantified in this study reveal that the role of the SAT is larger than of the ET in the English lesson learning process. This activity is quite dominant performed by SAT in each learning activity. This contrasts with the results of research that teachers give greater attention to students with special needs compared to non-special needs students (*e.g.*, Kemp and Carter, 2002; Lee, Wehmeyer and Soukup et al, 2010; Nelson and Roberts, 2000; Cameroon, 2014). The interviews conducted showed that, if the ET is giving attention to the GS and the SLS requires detailed explanations, then the SAT automatically and directly takes over this teaching task. If the SAT does not take over, the SLS may lack initiative to do the work, or will not ask about the difficulties being faced; therefore, the initiation always comes from the SAT. These results are consistent with the initiation and the percentage obtained.

The SLS dominates interactions with the SLS not only in explaining the lesson, but also in providing motivation and attention. The same results are also consistent current findings on the presence of paraprofessionals, like teacher aides and assistants, primary support for

special needs students (Giangreco and Broer, 2005), reducing the interaction of the SLS with classmates and teachers (Giangreco and Broer, 2005; Giangreco, Edelman and Broer et al., 2001; Harris, 2011). Another study instead revealed that the presence of an assistant teacher in a class of students with disabilities is very helpful in improving the satisfaction and effectiveness of the classroom teachers (Blatchford, Bassett, Brown, Martin, Russell and Webster, 2009a) as well improving the motivation, attention, and behavior of pupils (Howes, 2003). Besides helping students stay focused and follow orders, this supports their organizational skills and ability to handle matters relating to social behavior (Symes & Humphrey, 2011).

This study revealed that the presence of the SAT is very helpful in explaining the academic material, providing motivation, improving focus, and provide opportunities for the SLS to interact with classmates - but it cannot be denied that the dependence on the SLS to SAT is very large. The recent absence of the SAT made it so that the SLS could not learn to the maximum because of the lack of attention from the ET. Dependence of the SLS on the SAT also reduces interactions with other students and, who can influence the social development and skills of the students (Harris, 2011). In addition to academic achievement, independence is an important skill for the students to be useful in the future. For this reason, both teachers should be able to support that success. This is in line with the opinion of Mitchell (2008) that, no matter how high the quality of teacher aids, they cannot be not allowed to take the place of teachers, although the purpose of teacher aides support and assist students with special needs, it would be better to avoid the dependence on special needs students to teaching aids, and thus it is very important for teachers and teacher aides to work together in planning learning.

The role both of the teachers should be maximized, especially in the form of learning interactions, because these teacher-student interactions are vital to the academic and social development of students. This reflects the opinion that interaction helps the development of students (Pianta, Belsky, Vandergift, Houts & Morrison, 2008), improves the academics and social behavior of students with emotional problems (Sutherland, 2000) and has good consequences for learning and academic development (Ladd, Herald & Kochel, 2006; Viljaranta et.al, 2015). The SAT has a crucial role as a teacher aide to the ET in dealing with SLS is and improving the academic and social abilities of the SLS. It is, however, crucial for the duties, responsibilities, and roles of each teacher to be preserved, preventing dependence of the SLS on one of the teachers. Co-creation of learning plans is very important and can help ensure that learning activities are both meaningful and fun for the SLS.

### **Limitations of the Study**

This study involved only 23 student participants, of whom only one was a slow learner, from one school in one city. School selection was a main obstacle, because it is difficult to find inclusive schools that have both slow learner students and special assistant teachers. Although there are limitations to generalizability of these findings, its results clearly demonstrate that the role of the special assistant teacher is greater than that of the general teacher in addressing slow learner students through instructional interactions.

### **Future Research**

The findings of this study can be analyzed with future research in mind on suitable methods for the SLS in Indonesia to achieve maximal academic ability and independence according to their characteristics and limitations, which is the mutual responsibility of regular teachers and

teacher aides. They must be able to work together to create a learning plan to improve the academic and social abilities of students with special needs. Regular teachers and assistant teachers should be able to make a study outlined in the curriculum to more attractive, relevant, and accessible to all students. They faced with the problem of designing some mix of learning strategies that can be achieved by all learners (Tomlinson & Edison 2003 ; Villa et al, 2005).

For matters relating to the learning independence the SLS, it would be beneficial for general teachers to cooperate with teacher aides by making keyword cards that consist of the material being studied according to topic and sequence clear guidelines about what should be done by the SLS, and the first resource if the SLS meets with difficulties—for instance, whether the SLS should initially ask for help from classmates. Afterwards, the SLS can ask the SAT or ET by his or her own initiative, and that question can be managed through clear rules and habituation to minimize dependence of the SLS on teacher aides. The general teacher can supervise and the teacher aide or special assistant teacher can oversee the development of the SLS.

## **Conclusion**

As a primary teacher, the ET is aware of his or her duties to attend to all students and ensure that they achieve maximum academic results. Yet to achieve this, the ET must of course be able to manage the class in such a way that the needs of all students are accommodated including those of the SLS. While the SAT as a teacher helps the ET in learning activities, this study concludes that both academic and non-academic interactions occurred more frequently between the SAT and SLS than between the ET and SLS.

This study concludes that both academic and non-academic interactions occurred more frequently between the SAT and SLS than between the ET and SLS. The pattern of sentences, whether statements or questions, used to initiate learning interactions between the SAT and SLS demonstrates the commitment of the SAT to stimulating critical thinking skills, but also supports the domination of the SAT in nearly every learning process of the SLS. These results indicate that, although the role of the SAT is as a teacher who helps the SLS, the SAT is more dominant in relation to the SLS than the ET is the independence of the SLS. Of course, this dominance affects. The dependence of the SLS on the presence of the SAT affects both academic and non-academic aspects and creates a reliance on the SAT to perform tasks, solve problems, provide motivation, and help the SLS focus on the learning process. Due to this dependence, when the SAT was absent from the class, the SLS did not initiate or complete tasks, and tended not to conduct any activity at all until it was explained in detail by the ET. Even though the presence of the SAT is indispensable for the SLS to attain academic abilities, the role of the SAT should not become more dominant than that of the ET, so that the SLS can also develop self-reliance. It is very important for the SAT and ET to engage in lesson planning together in order to craft main tasks that can be used by all students, including the SLS.

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**References:**

- Ainscow, M. (2000) The next step for special education: supporting the development of inclusive practice, *British Journal of Special Education*, 27(2), 76–80.
- Aziz, N. A., Sugiman., & Prabowo, A. (2015) Analisis Proses Pembelajaran Matematika pada Anak Berkebutuhan Khusus (ABK) Slow Learner di Kelas Inklusif SMP Negeri 7 Salatiga. *Kreano Jurnal Matematika Kreatif- Inovatif*, 6(2), 111-120.
- Blatchford, P., Bassett, P., Brown, P., Martin, C., Russell, A. & Webster, R. (2009) *Deployment and Impact of Support Staff Project*. London: DCSF.
- Bouck, E. C. (2006) How Educational Placements Impact Classroom Interactions: Experiences of Six Secondary Students with Mild Mental Impairment. *Journal of Classroom Interaction*, 41(1), 4-14.
- Bourke, P., & Carrington, S. (2007) Inclusive Education Reform: Implications for Teacher Aides. *Australasian Journal of Special Education* 31(1),15-24.
- Brown, J., A., & McIntosh, K. Training, Inclusion, and Behaviour: Effect on Student–Teacher and Student–SEA Relationships for Students with Autism Spectrum Disorders. *Exceptionality Education International*, 22(2), 77-88.
- Burdick, C., & Theoharis, J.C. (2012) ‘Creating Effective Paraprofessional Support in the Inclusive Art Classroom.’ *Art Education*, 65(6), 33-37.
- Calder, I., & Grieve, A. (2004). Working with other adults: What teachers need to know. *Educational Studies*, 30, 113–126.
- Cameron, D. L. (2014). ‘An examination of teacher–student interactions in inclusive classrooms: teacher interviews and classroom observations.’ *Journal of Research in Special Educational Needs*, 14(4), 264-273.
- Cardon, T. A., & Wilcox, M. J. (2011). Promoting imitation in young children with autism: A comparison of reciprocal imitation training and video modeling. *Journal of Autism and Developmental Disorders*, 41, 654–666. doi:10.1007/s10803-010-1086-8.
- Cazden, C. (2001). Classroom discourse: The language of teaching and learning. 2nd ed. Portsmouth, NH: Heineman.
- Center for Curriculum, Research and Teaching Ministry of National Education of Indonesia (2007). Jakarta: Kementerian Pendidikan Nasional Indonesia
- Cooter, K. S., & Cooter Jr, R. B. (2004). One Size Doesn’t Fit All: Slow Learners In The Reading Classroom. *The Reading Teacher*. 57 (7), 680-684.
- D’Amico, J., & Gallaway, K. (2010). Differentiated Instruction for the Middle School Science Teacher. San Francisco: Jossey-Bass.

Daniels, H. (ed.) (2000) Special education re-formed: beyond rhetoric?.London: Falmer Press.

Directorate of Exceptional School Education/ PSLB. (2004). Panduan Khusus Penyelenggaraan Pendidikan Inklusif. Jakarta: Direktorat Jenderal Pendidikan Dasar Kementerian Pendidikan dan Kebudayaan Republik Indonesia.

Education & Culture Ministry of Republic of Indonesia (2011). Pedoman Umum Penyelenggaraan Pendidikan Inklusif. Jakarta

Empowerment Women and Child Protection Ministry of Republic of Indonesia (2013) Panduan Penanganan Anak Berkebutuhan Khusus Bagi Pendamping (Orang Tua, Keluarga, Dan Masyarakat). Jakarta.

Fikariyanto, R. (2015). Pola interaksi guru dan murid ABK (anak berkebutuhan khusus) dalam proses kegiatan belajar di SMP Negeri 15 Cirebon. Thesis Abstracts. Retrieved from <http://eprints.upnyk.ac.id/7567>.

Forlin, C. (2000). Support teacher (learning difficulties): Changing roles in Queensland. *Special Education Perspectives*, 9(2), 3–12.

French, N. (2003). Considering paraprofessional training, roles and responsibilities. *Teaching Exceptional Children*, 34(20), 6.

French, N., & Pickett, A, (1997), Paraprofessionals in special education: Issues for teacher educators. *Teacher Education and Special Education*, 20,61-73.

Giangreco, M. F. (2003a). Paraprofessional support of students with disabilities in general education. Final report. (Report No. H324M980229) District of Columbia, USA: Department of Education's Office of Special Education. (Eric Document Reproduction Service No. 483002).

Giangreco, M. F., Edelman, S. W., & Broer, S. M. (2001). Respect, appreciation, and acknowledgement of paraprofessionals who support students with disabilities. *Exceptional Children*, 67, 485–498.

Giangreco, M., & Broer, S. (2005). Questionable utilization of paraprofessionals in inclusive schools: Are we addressing symptoms or causes? *Eocus on Autism and Other Developmental Disabilities*, 20, 10-26.

Hamre, B. K., & Pianta, R. C. (2001). Early teacher-child relationships and the trajectory of children's school outcomes through eighth grade. *Child Development*, 72, 625–638. Retrieved from <http://www.wiley.com/bw/journal.asp?ref=0009-3920&site=1>

Hargie, O. (2006). The Handbook Of Communication Skills. London: Routledge

Harris, B.A. (2011). Effects of the Proximity of Paraeducators on the Interactions of Braille Readers in Inclusive Settings. *Journal of Visual Impairment & Blindness*. 105 (8), 467-478.

- Hassan, M.U., Hussain, M., Parveen, I., & De Souza, J. (2015). Exploring Teachers' Experiences And Practices In Inclusive Classrooms Of Model Schools. *Journal of Theory and Practice in Education*. 11(3), 894-915.
- Horner, R. H., Carr, E. G., Halle, J., McGee, G., Odom, S., & Wolery, M. (2005). The Use of Single-Subject Research to Identify Evidence-Based Practice in Special Education. *Exceptional Children*, 71, 165–179.
- Howes, A. (2003) ‘Teaching reforms and the impact of paid adult support on participation and learning in mainstream schools’, *Support for Learning*, 18,147–153.
- Hughes, J., & Kwok, O. (2007). Influence of student-teacher and parent-teacher relationships on lower achieving readers’ development and achievement in the primary grades. *Journal of Educational Psychology*, 99, 39–51. doi:10.1037/0022-0663.99.1.39.
- Imanuddin, D. (2013). Perkembangan keterampilan social anak berkebutuhan khusus melalui pembelajaran kooperatif tipe STAD pada setting inklusif. Retrieved from [http://repository.upi.edu/3835/5/T\\_PKKH\\_0908260\\_Chapter1.pdf](http://repository.upi.edu/3835/5/T_PKKH_0908260_Chapter1.pdf).
- Irenewaty, T., & Arman. Evaluasi Kebijakan Pendidikan Inklusif Di SMA Muhammadiyah 4 Yogyakarta, Retrieved from <http://staff.uny.ac.id/system/files/penelitian/Dr.%20Aman,%20M.Pd./B-7.PENELITIAN.pdf>.
- Jordan, A., & Stanovich, P. J. (2001). Patterns of Teacher–Student Interaction in Inclusive Elementary Classrooms and Correlates with Student Self-Concept. *International Journal of Disability, Development and Education*, 48(1), 33-52.
- Kazdin, A. E. (2011). Single-case research designs: Methods for clinical and applied settings (2nd ed.). New York, NY: Oxford University Press.
- Kellet, M. (2004). Intensive Interaction in the inclusive classroom: using interactive pedagogy to connect with students who are hardest to reach. *Westminster Studies in Education*, 27(2), 175-188.
- Kennedy, C. H. (2005). Single-case designs for educational research. Boston, MA: Allyn & Bacon.
- Kemp, C. & Carter, M. (2002) The social skills and social status of mainstreamed students with intellectual disabilities. *Educational Psychology*, 22, 391–411.
- Kingsbury, A. (2005). Education. U.S. *News & World Report*, 138(10), 48.
- Krishnakumar, P., Geeta, M. G., & Palat, R. (2006). Effectiveness of individualized educational program for slow learners. *Indian Journal of Pediatrics*, 73, 135-137.
- Kugelmass, J.W., (2004). The Inclusive School. New York: Columbia University.
- Ladd, G. W., Herald, S. L., & Kochel, K. P. (2006). School readiness: Are there social prerequisites? *Early Education and Development*, 17, 115–150. doi:10.1207/

s15566935eed1701\_6.

- Lee, S.-H., Wehmeyer, M. L., Soukup, J. H. & Palmer, S.B. (2010) 'Impact of curriculum modifications on access to the general education curriculum for students with disabilities.' *Exceptional Children*, 76 (2), 213–33.
- Lisdiana, A. (2012). Prinsip Pengembangan Atensi pada Anak Lamban Belajar. Kementerian Pendidikan dan Kebudayaan Republik Indonesia: Bandung. Retrieved from <https://sumberbelajar.belajar.kemdikbud.go.id/PPB/Konten%20Materi/89%20fasilitator%20plb3/diklat%2091/modul%20207/Buku/modul%20atensi%20video.pdf>
- McLachlan, B. (2014). Exploring the work and learning stories of para-teachers in a college for further education in England. *Support for Learning*, 29 (3), 230-243.
- McLeskey, J., & Waldron, N. L., (2000). *Inclusive Schools Action*. Alexandria, VA: ASCD.
- McNally, R. D., Cole, P. G., & Waugh, R. F. (2001). Regular teachers' attitudes to the need for additional classroom supports for the inclusion of students with intellectual disability. *Journal of Intellectual & Developmental Disability*, 26, 257–273.
- Mitchell, D. (2008). What Really Works in Special and Inclusive Education. Oxon: Routledge.
- Moller, J. D., & Datillo, J (2015) Applying Quality Indicators To Single-Case Research Designs Used In Special Education: A Systematic Review. *Psychology in the Schools*, 52(2), 139-153.
- Nelson, J. R. & Roberts, M. L. (2000) 'Ongoing reciprocal teacher-student interactions involving disruptive behaviors in general education classrooms.' *Journal of Emotional and Behavioral Disorders*, 8, 27–37.
- Nind, M., Sheehy, K. & Simmons, K. (Eds) (2003a) Inclusive education: learners and learning contexts (London: David Fulton).
- Olofsson, A. D., & Lindberg, J. A., (2012). Informed Design of Educational Technologies in Higher Education, Hersey, PA: IGI Global.
- Pearson, S., Chambers, G., & Hall, K. (2003). 'Video material as a support to developing effective collaboration between teachers and teaching assistants.' *Support for Learning*, 18(2), 83–87.
- Pianta, R. C, Belsky, J., Vandergrift, N.. Houts, R., & Morrison, F. (2008). Classroom effects on children's achievement trajectories in elementary school. *American Education Research Journal*, 49, 365-397.
- Powell, R.G., & Casseau, D., (2004). Classroom Communication And Diversity. London: Lawrence Ebaum Associates.
- Puri, M., & Abraham, G. (2004). Handbook of Inclusive Education for Educators, Administrators, and Planners. New Delhi, India: Sage Publications Inc.

- Robinson, H. A., (2005). *The Ethnography of Empowerment: The Transformative Power of Classroom Interaction*. London: Taylor & Francis e-Library.
- Rymes, B. (2008). *Classroom Discourse Analysis: A Tool for Critical Reflection*. Cresskill, NJ : Hampton Press.
- Sadler, H. (2014). Researching the influence of teaching assistants on the learning of pupils identified with special educational needs in mainstream primary schools: exploring social inclusion, *Journal of Research in Special Educational Needs*, 14(3), 145-152.
- Sapon, M. & Shevin. (2007). Widening the Circle, The Power of Inclusive Classrooms. Massachusetts: Beacon Press.
- Sardiman, A.M., (2014) Interaksi dan Motivasi Belajar Mengajar. Jakarta: Raja Grafindo Persada.
- Shaw, S. R., (2010). Rescuing Students From the Slow Learner Trap. *Principal Leadership*. 10(6), 12-16.
- Slack, M. B., & Boyer, M. A. (1964) The Slow Learner in the Academic High School. *Educational Leadership*, 380-387.
- Sorsby, C. (2004). Forging and strengthening alliances. In F. Armstrong, & M. Moore (Eds.), *Action research for inclusive education: Changing places, changing practices, changing minds* (pp. 48–62). London: RoutledgeFalmer.
- Sunaryo. (2009). Manajemen Pendidikan Inklusif (Konsep, Kebijakan, dan Implementasinya dalam Perspektif Pendidikan Luar Biasa) (Paper retrieved from file.upi.edu/Direktori/FIP/JUR.\_PEND.\_LUAR\_BIASA/1956072219. Accessed. 27.02.2016)
- Sutherland, K. S. (2000). Promoting positive interactions between teachers and students with emotional/behavioral disorders. *Preventing School Failure*, 44(3), 110-120.
- Symes, W., Humphrey, N. (2011). The deployment, training and teacher relationships of teaching assistants supporting pupils with autistic spectrum disorders (ASD) in mainstream secondary schools. *British Journal of Special Education*, 38(2), 57-64.
- Taconis, R., Van der Plas, P., & Van der Sanden, J. (2004). The development of professional competencies by educational assistants in school-based teacher education. *European Journal of Teacher Education*, 27, 215–240.
- Tanner, L.N., & Tanner, D. (1969). ‘The Teacher Aide: A National Study Of Confusion.’ *Educational Leadership*, 26: 765-769.
- Tash (2011). Tash and NDSS Partner with CPSD for Congressional Briefing on Education Reform. Retrieved February 1, 2013. Retrieved from <http://tash.org/tash-and-ndss-partner-with-cpsd-forcongressional-briefing-on-education-reform/>.

- Tomlinson, C. A., & Eidson, C. C. (2003). Differentiation in practice: A resource guide for differentiating curriculum, Grades 5–9. Alexandria, VA: Association for Supervision & Curriculum.
- Triani, N., & Amir. (2013). Pendidikan Anak Berkebutuhan Khusus Lamban Belajar (Slow Learner). Jakarta Timur: PT. Luxima Metro Media.
- Villa, R.A., Thousand, J.S., Nevin, A., & Liston, A. (2005). Successful inclusive practices in middle and secondary schools. *American Secondary Education*, 33(3), 33-50.
- Triani, N., & Amir. (2013). Education for Student with Slow Learner. Jakarta: PT. Luxima Metro Media.
- Wang, L. (2014). A Meta-Analysis of Peer-Peer Interaction in L2 English Speaking Assessment, *English Teaching & Learning*. 38(3), 106.
- Westwood, P., & Graham, L. (2003). Inclusion of students with special needs: Benefits and obstacles perceived by teachers in New South Wales and South Australia. *Australian Journal of Learning Disabilities*, 8, 3–15.
- Wilkins, R. (2002). From assistants to paraprofessionals. *Education Journal*, 62, 13.
- Wiberg, M. (2005). The Interaction Society. Hersey, PA: Idea Grup Inc
- Woods, A., Wyatt Smith, C., & Elkins, J. (2005). Learning difficulties in the Australian context: Policy, research and practice. *Curriculum Perspectives: An Australian curriculum journal*, 25, 1–14.

## **Women with Disabilities in the State of Qatar: Human Rights, Challenges and Means of Empowerment**

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### **Abstract**

*This study explored human rights for Qatari women with disabilities, challenges and means of empowerment as perceived by females and males both with and without disabilities. The Questionnaire of the Rights of Women with Disabilities (QRWD) was developed using the Articles of the Convention on the Rights of Persons with Disabilities (CRPD). Results indicated that participants without disabilities, especially men, less acknowledged the rights of women with disabilities. Furthermore, women with disabilities did not emphasize civil and political rights, but highly addressed the obstacles related to the society and legislative and political empowerment. Findings were discussed in the light of the previous literature and further recommendations were provided.*

**Keywords:** *Women with disability; human rights; CRPD; Middle East; Qatar.*

### **Introduction**

Recent movements towards achieving social inclusion of persons with disabilities is framed around a human rights perspective. Such movements believe that everyone must be able to exercise their fundamental human rights and adopt the call to support disabled people in exercising their rights, and to promote their full inclusion and active participation as equal members of their families, communities and societies. This social-ethical rational of inclusion is premised by the disability rights and educational reform movements which used some of arguments and tactics of the civil rights movement of the 1960s for crystallizing awareness of

problems inherent in the segregation of persons with disabilities (Bailey et al., 1998; Hassanein, 2015).

The goal of the Civil Rights movement was to gain equal opportunities and equal rights for all regardless of race, gender, ethnicity, or handicapping condition. Therefore, there was a change in the conceptualization of disability as the result of this broader civil rights movement in society towards “*normalization*” and appreciating social justice and human rights (Gaad, 2004, Hassanein, 2015). Such efforts were supported by the issue of The Convention on the Rights of Persons with Disabilities (CRPD) (United Nations, 2006). The Convention establishes a binding for applying human rights to all persons with disabilities. Notably, Qatar was a signatory to the CRPD in 2007 at the United Nations. The CRPD’s fundamental purpose is to ensure the inherent dignity of persons with disabilities.

The Convention celebrates human diversity and human dignity. Its main message is that persons with disabilities are entitled to the full spectrum of human rights and fundamental freedoms without discrimination. This is reflected in the Convention’s preamble and throughout its articles. In prohibiting discrimination based on disability and establishing that reasonable accommodation shall be provided to persons with disabilities with a view to ensuring equality, the Convention promotes the full participation of persons with disabilities in all spheres of life. In establishing the obligation to promote positive perceptions and greater social awareness towards persons with disabilities, it challenges customs and behavior based on stereotypes, prejudices, harmful practices and stigma relating to persons with disabilities. Importantly, the Convention and its Optional Protocol challenge previous perceptions of disability—as a medical problem or a generator of pity or charitable approaches—and establish an empowering human rights-based approach to disability (United Nations, 2014).

Although women with disabilities and men with disabilities have different life experiences due to biological, psychological, economic, social, political and cultural characteristics associated with being female and male, women with disabilities face multiple discrimination and are often more disadvantaged than men with disabilities in similar circumstances (Women With Disabilities Australia, WWDA, 2007). Underlying the double discrimination is negative attitudes about women compounded by negative attitudes toward disability that often cut across cultures and level of development. Women and girls with disabilities are commonly stereotyped as sick, helpless, childlike, dependent, incompetent and asexual, greatly limiting their options and opportunities (Roussou, 2003).

This study explores how Qatari females with disabilities perceive their human rights, and the legitimacy of having those rights as perceived by females with no disability and males with and without a disability. A great deal of work has addressed disabilities and human rights (see Bruce, Quinlivan, & Degener, 2002; Frohmader & Meekosha, 2012). However, very little information is known about disability and human rights in the Middle East, especially for women (Abu-Habib, 1997; Fiduccia & Wolfe, 1999). This international literature indicates that women with disabilities face multiple discrimination and are often more disadvantaged than men with disabilities in similar circumstances. Women with disabilities are often denied equal enjoyment of their human rights, in particular by virtue of the lesser status ascribed to them by tradition and custom, or as a result of overt or covert discrimination. (UN Committee on Economic, Social and Cultural Rights (CESCR, 2005). Women with disabilities face particular disadvantages in the areas of education, work and employment, family and reproductive rights, health, violence and abuse. (Women With Disabilities Australia (WWDA, 2007).

Although the State of Qatar gives special attention and care for women with disabilities (Qatar Vision, 2030), women still face some difficulties (Al-Attiyah and Nasser, 2014). For example, according to a survey conducted by the Supreme Counsel for Family Affairs in Qatar (Al- Merekhi & Al-Buainain, 2012), the number of disabled males (24.5%) significantly exceeds the number of disabled females (8.6%) in terms of employment. Additionally, girls with disabilities do not enjoy their full rights of education. Indeed, this is not a specific issue in Qatar. Rather it seems to be an international issue. The UNESCO (2000) report stated that this is a pervasive problem across countries and cultures. It mentioned how this problem is articulated in several cultures. Rousso, (2001) argued that the literature on disabled girls and education is sparse and this holds true for countries at all levels of development, including the United States.

The most frequently mentioned barrier to education for girls with disabilities was the cultural bias against women, leading to preferential treatment and allocation of resources and opportunities to male children, at the expense of their sisters. Education is deemed less important for girls, who are expected to become wives and mothers, whereas boys, destined to become breadwinners, are given priority in schooling (Rousso, 2003).

### **Gender, Disability and Human Rights**

According to the Convention of Human Rights (1948) and the Convention on the Rights of Handicapped Individuals, all individuals are born free and equal in dignity and rights. As stipulated, all men and women with disabilities have the right to live in dignity. Furthermore, human rights are universal and do not differ for individuals with disabilities. Despite the recognition of the equality and rights of women and women with disabilities and in spite of all efforts to revitalize and empower women in society, women in general face many of the aspects of discrimination and inequalities in the law.

The interaction between gender and disability creates vulnerability for women with disabilities regarding violations of their rights (Ferri & Gregg, 1998). These women become vulnerable to the challenges associated with the financial and social aspects, low rates of employment and wages among women with disabilities (Azaamt, 2000), low educational levels, high rates of sexual and physical violence and limited access to health services, including reproductive health care (Fiduccia & Wolfe, 1999). They also have less chance to get married compared with other women or disabled men and once married, are more likely to be divorced. Furthermore, disabled women and girls are extremely vulnerable to physical and sexual abuse, with the resulting additional stigma and shame (Jones and Webster, 2006).

Al-Attiyah (2006) demonstrated that the main problems faced by women with disabilities are as follow: all types of physical and verbal violence, psychological abuse that is represented in isolation and the lack of communication. Women with disabilities are more likely to suffer economic exploitation that refers to acts reducing a woman's ability to control property, funds, their share of inheritance and others illegally using of her funds. Finally, they are more likely to suffer from neglect of her health, nutrition and personal care.

Furthermore, studies have demonstrated that women with disabilities stated that they did not exercise their rights in various fields, such as the right of self-determination and had limited opportunities to receive education appropriate because of their abilities compared with other

women and even with disabled men (Ferri & Gregg, 1998). Additionally, Barker and Maralani (1997) found that 79% of disabled individuals expressed that they suffer from problems in mobility and transportation preventing them from performing life activities. Other studies highlighted further burdens that disabled women face including exposure to abuse in the community, isolation and violence and weakened identity (DeWees, 2006; Santos, 2008), humiliation and negative attitudes (Mustafa, 2004), and gender inequality (Santos, 2008). Several factors have been identified to contribute to the violation of rights of women with disabilities. These factors include lack of awareness of their rights (Ferri & Gregg, 1998), prejudice against the disabled, societal gender discrimination, the tendency to stigmatize, bureaucratic procedures and the idea of segregation in special education institutions (Rauzon, 2002; Al-Kassas, 2004; DeWees, 2006; Hassan, 2011).

On the other hand, several means of achieving empowerment for women with disabilities have been suggested in the literature. It is essential from childhood for the family to allow maximum autonomy for their daughter with a disability and to encourage her to engage and interact with the community (Rousso, 2001). To enable women with disabilities to access their rights as confirmed by the Convention on Human Rights and the Convention on individuals rights of the disabled, governments signed these agreements and worked on the legislation passing several laws to ensure that women with disability rights. These include rights in areas such as education, rehabilitation or health. The right to be integrated into society, to live in dignity and to have access to appropriate services such as health, appropriate prosthetic devices, provisions for adequate job opportunities and to provide adequate financial support for who are unable to work. Governments have urged institutions to take the necessary measures to ensure the translation of these rights and the laws of the practices of the effectiveness (Rousso, 2001).

From the above, it can be stated that women with disabilities need the support of the community, family and support for their self-confidence (Rauzon, 2002). They also need rehabilitation and empowerment of educational attainment and reduce illiteracy, unemployment rates that they suffer from and improve their economic and social level (Hassan, 2011). The results of previous studies highlighted the importance awareness of women with disabilities of their rights enshrined in the Convention on the Rights of persons with disabilities and supported the efforts to eliminate discrimination between men and women and promote equality and citizenship rights (Hassan, 2011; Farouk, 2001). However, in fact, no study –up to the knowledge of researchers- identified the extent of the awareness of women with disabilities for their rights that set forth in the Convention on the rights of disabled and translated by many countries in the form of legislation and laws.

Qatar plays a leading role through demonstrating the interest in the provision for education and health services and equal opportunities at work for disabled women. Qatar has issued rules and regulations that defend human rights and protection for women with disabilities from the abuses that take place in all areas to work. However, few studies have sought to identify the extent of awareness of individuals with disabilities, including women with disabilities regarding their rights guaranteed by law or to assess the awareness and knowledge of disabled individuals so they are able to better gain access to specialized services.

Furthermore, however the international literature about rights of women with disabilities is growing, little is known about such issues in the Middle East in general and Qatar in particular. Such growing research, while invaluable in identifying barriers, rarely includes comparisons with both disabled boys and non-disabled girls, making it difficult to identify the

joint impact of gender and disability bias. Given the lack of research in Qatari context, it is necessary to investigate such issues in Qatar hoping it could provide some national and international insights that could enhance rights of women with disabilities and could provide useful worldwide insights into gender and disability. The study aims to answer the following questions:

- What are the human rights of disabled women as perceived by University Students at Qatar University and are there any significant differences among the human right dimensions according to the gender (male, female), and type of undergraduate students (with disabilities, without disabilities)?
- What are the obstacles facing women accessing their human rights as perceived by University Students at Qatar University and are there any significant differences among these obstacles dimensions according to the gender (male, female), and type of under-graduate students (with disabilities, without disabilities)?
- What are the variety of empowerment means that may help women with disabilities to practice the human rights, and are there any significant differences among empowerment meaning dimensions according to gender and type of under-graduate students?

## **Methods**

### **Participants**

A total of 128 undergraduate students at Qatar University volunteered to participate in this study. The sample included 30 females with a disability ( $M_{age} = 21.4$  years,  $SD_{age} = 1.8$ ), 18 males with a disability ( $M_{age} = 20.8$  years,  $SD_{age} = 2.6$ ), and 80 students without a disability (40 females and 40 males;  $M_{age} = 19.7$  years,  $SD_{age} = 1.7$ ). For the disabled females, there were 11 students with a motor disability, 13 with a sensory disability (visual or hearing impairments), and 6 with speech impairments. For the disabled males, there were 8 students with a motor disability, 8 with a sensory disability (visual or hearing impairments), and 2 with speech impairments.

### **Measure**

For this study, the CRPD was adapted to build a self-reported questionnaire consisting of three parts. Part 1 included seven categories of human rights: civil and political rights, social protection, health welfare, education rights, social rights, family construction, and personal rights. Part 2 includes three types of barriers or obstacles for achieving the human rights. The first type is related to the individual woman. The second is related to the family while the third type is related to society. Part 3 addressed the ways of empowerment that help women with disabilities achieve their human rights. There are four dimensions of empowerment: legislative & political, economic, social, and educational.

The Questionnaire the Rights of Women with Disabilities (QRWD), a self-rating questionnaire consisting of three parts was constructed using the CRPD's Articles. Part 1 consisted of 28 items measuring seven categories of human rights: civil and political rights (9 items), social protection (3 items), health welfare (3 items), education rights (3 items), social rights (3 items), family construction (3 items), and personal rights (3 items). Part 2 consisted of 21 items assessing three types of obstacles that prevent individuals from achieving human rights. These are obstacles related to the women themselves (7 items), the family (5 items), or the society (5 items). Part 3 consisted of 18 items measuring four ways of empowerment: legislative & political (4 items), economic (3 items), social (4 items), and educational (3

items). Responses are reported on a three-point Likert rating scale (agree, neutral, and disagree). All participants with disabilities were administered the QRWD individually, but participants without a disability were administered in groups.

To ensure the face validity of the questionnaire, it was sent to six professors specializing in Special education and law at Qatar University. Considering their comments, changes were made (e.g. adding some items and removing others. Thus although the CRPD reports 50 Articles, only 28 Articles were used in this questionnaire.

To assess the reliability of the questionnaire, an internal consistency coefficient for the instrument was calculated using Cronbach's alpha method for each dimension. The reliability coefficients were reported high rates for the three dimension of the QRWD (Human rights: 0.83; Obstacles: 0.88; Empowerment: 0.91). Also, there were generally good inter-correlations among the sub-scales of those three parts (see Tables 1 to 3). These results indicated that the reliability coefficients were satisfactory for the purpose of the present study.

**Table 1. Inter-correlations among seven sub-scales of the human rights**

	Social Protection	Health Welfare	Rights for Education	Social Rights	Family Construction	Personal Rights
Civil & Political	0.64***	0.43*	0.54**	0.37*	0.51**	0.21
Social Protection		0.59**	0.57**	0.39*	0.53**	0.18
Health Welfare			0.70***	0.46**	0.47**	0.05
Rights for Education				0.72***	0.52**	-0.05
Social Rights					0.44*	0.08
Family Construction						0.42*

Note: \*= p< 0.05; \*\*= p< 0.01; \*\*\*= p< 0.001.

**Table 2. Inter-correlations among t types of obstacles**

	Obstacles related to the family	Obstacles related to the society
Obstacles related to the woman	0.45*	0.85***
Obstacles related to the family		0.52**

Note: \*= p< 0.05; \*\*= p< 0.01; \*\*\*= p< 0.001.

**Table 3. Inter-correlations among the four ways of empowerment.**

	Economic	Social	Educational
Legislative & political	0.66***	0.80***	0.58**
Economic		0.65***	0.67***
Social			0.70***

Note: \*= p< 0.05; \*\*= p< 0.01; \*\*\*= p< 0.001.

## Procedures

The researchers distributed the questionnaires among women with disabilities and without disabilities and men with disabilities and without disabilities in person at the end of the first academic semester of 2015/2016. In order to ensure a representative sample, a certain percentage of persons with disabilities and without disabilities were involved. Before distributing the questionnaires, the researchers explained the purpose of the study to the participants. Moreover, the participants of this study were encouraged to read the items carefully before choosing the appropriate choice. Participants were assured of confidentiality

and anonymity. The researchers collected all completed questionnaires and started data analysis.

## Data Analysis

In order to address the research questions, descriptive statistics, including means and standard deviations, were used to describe each dimension for the questionnaire. All responses on the scale were coded, entered into the computer and analyzed using the Statistical Package for Social Sciences (SPSS). The data collected were analyzed and then expressed through means and standard deviations. The t-test for an independent sample and one-way analysis of variance (ANOVA) were used as the main statistical techniques in the study, to determine whether there are significant differences among perceptions about human rights, obstacles facing women's human rights, and empowerment means according to the following independent variables: gender (male, female), and type of under-graduate students (with disabilities, without disabilities).

## Results

### Human Rights

Table 4 illustrates the descriptive statistics for the human rights of disabled women as perceived by the four groups of participants. These data were subjected to a series of 2 (Condition: disability vs. non-disability) x 2 (Gender: females vs. males) between-participant Analyses of Variance (ANOVA). There were significant main effects of Condition for the civil and political rights,  $F(1, 124) = 12.69$ ,  $p = 0.0005$ , Social Protection,  $F(1, 124) = 13.01$ ,  $p = 0.0004$ , Health Welfare,  $F(1, 124) = 22.38$ ,  $p < 0.001$ , Rights for Education,  $F(1, 124) = 120.65$ ,  $p < 0.0001$ , Social Rights,  $F(1, 124) = 54.92$ ,  $p < 0.001$ , Family Construction,  $F(1, 124) = 41.27$ ,  $p < 0.001$ , and Personal Rights,  $F(1, 124) = 20.27$ ,  $p < 0.001$ . For all of these seven variables, there were advantages for participants with disabilities.

**Table 4. Descriptive statistics for the human rights of females with disabilities**

	Disabled Females		Disabled Males		non-disabled females		non-disable d males
	M	SD	M	SD	M	SD	M
Civil & Political	89.5	12.0	77.4	25.4	74.0	8.2	72.5
Social Protection	95.6	9.5	93.2	16.2	93.6	12.8	72.9
Health Welfare	96.3	9.8	98.8	5.2	92.2	16.5	73.5
Rights for Education	97.8	6.8	95.7	9.4	72.2	13.8	68.9
Social Rights	95.2	10.0	95.1	10.2	77.5	13.4	73.8
Family Construction	93.7	10.4	92.6	12.6	68.1	16.1	81.8
Personal Rights	96.1	8.1	95.4	8.2	89.2	17.2	76.5

In addition, there were significant main effects of gender for the civil and political rights,  $F(1, 124) = 5.71$ ,  $p = 0.02$ , Social Protection,  $F(1, 124) = 13.97$ ,  $p = 0.0003$ , Health Welfare,  $F(1, 124) = 6.61$ ,  $p < 0.01$ , Family Construction,  $F(1, 124) = 5.42$ ,  $p < 0.02$ , and Personal Rights,  $F(1, 124) = 5.24$ ,  $p < 0.02$ . For all of these five fields, except Family Construction, there were advantages for female participants. Interestingly, male participants reported more rights for women with disability to have a family than female participants. However, gender

had no main effect for the rights for education,  $F(1, 124) < 1$ , and Social Rights,  $F(1, 124) < 1$ .

The interactions between Condition and Gender were significant for Social Protection,  $F(1, 124) = 8.78$ ,  $p = 0.004$ , Health Welfare,  $F(1, 124) = 11.47$ ,  $p < 0.0009$ , Family Construction  $F(1, 124) = 7.42$ ,  $p = 0.007$ , and Personal Rights,  $F(1, 124) = 4.10$ ,  $p < 0.04$ . However, there were no interactions for the Civil & Political right,  $F(1, 124) = 3.29$ ,  $p = 0.07$ , Rights for Education,  $F(1, 124) < 1$ , and Social Rights,  $F(1, 124) < 1$ .

Table 5 illustrates the subsequent Simple Main Effects for those significant interactions. To summarize, males without a disability acknowledged less human rights in the domains of social protection, health welfare, and personal rights than both males with a disability and females without a disability. However, both males without disabilities and females with disabilities acknowledged more rights for family construction than females without a disability. No other statistically significant effects were found.

**Table 5. The Simple Main Effects for the significant interactions among human rights.**

	<i>F</i>	<i>P</i>
<i>Social Protection</i>		
Females with a disability vs. females with non-disabilities	0.25	0.62
Males with a disability vs. males with non-disabilities	18.60	$<0.001$
Females with non-disabilities vs. males with non-disabilities	31.19	$<0.001$
Females with a disability vs. males with a disability	0.23	0.62
<i>Health Welfare</i>		
Females with a disability vs. females with non-disabilities	1.08	0.30
Males with a disability vs. males with non-disabilities	28.40	$<0.001$
Females with non-disabilities vs. males with non-disabilities	24.65	$<0.001$
Females with a disability vs. males with a disability	0.26	0.61
<i>Family Construction</i>		
Females with a disability vs. females with non-disabilities	49.82	$<0.001$
Males with a disability vs. males with non-disabilities	5.90	0.02
Females with non-disabilities vs. males with non-disabilities	17.73	$<0.001$
Females with a disability vs. males with a disability	0.06	0.80
<i>Personal Rights</i>		
Females with a disability vs. females with non-disabilities	3.66	0.06
Males with a disability vs. males with non-disabilities	18.36	$<0.001$
Females with non-disabilities vs. males with non-disabilities	12.91	$<0.001$
Females with a disability vs. males with a disability	0.03	0.87

To examine the relative importance of the seven human rights fields as perceived by women with disabilities, their data were subjected to a within-participant ANOVA. The results showed a significant main effect,  $F(6, 29) = 3.93$ ,  $p < 0.001$ . Post-hoc analyses were carried out using the Tukey HSD test (see Table 6). To summarize, they rated the Civil and Political rights as less important than Social Protection, Health welfare, Rights for Education, and Personal rights. No other significant differences were found.

**Table 6. Post-hoc Tukey HSD comparisons among the seven human rights as perceived by females with disabilities**

Comparisons	<i>qs</i>
Civil & Political vs. Social Protection	4.49*
Civil & Political vs. Health welfare	5.04**
Civil & Political vs. Rights for Education	6.14***
Civil & Political vs. Social Rights	4.22

Civil & Political vs. Family Construction	3.12
Civil & Political vs. Personal Rights	4.91*
Social Protection vs. Health Welfare	0.55
Social Protection vs. Rights for Education	1.65
Social Protection vs. Social Rights	0.28
Social Protection vs. Family Construction	1.38
Social Protection vs. Personal Rights	0.41
Health Welfare vs. Rights for Education	1.10
Health Welfare vs. Social Rights	0.83
Health Welfare vs. Family Construction	1.93
Health Welfare vs. Personal Rights	0.14
Rights for Education vs. Social Rights	1.93
Rights for Education vs. Family Construction	3.03
Rights for Education vs. Personal Rights	1.24
Social Rights vs. Family Construction	1.10
Social Rights vs. Personal Rights	0.69
Family Construction vs. Personal Rights	1.79

Note: \* = p < 0.05; \*\* = p < 0.01; \*\*\* = p < 0.001.

## Obstacles

Table 7 provides the descriptive statistics for the obstacles women face regarding human rights as perceived by the four groups of participants. These data were subjected to 4 (groups of participants) x 3 (obstacles) mixed-participant ANOVA. The results showed a significant main effect for the obstacles,  $F(2, 124) = 5.50$ ,  $p < 0.001$ . However, there was a non-significant main effect for participants' groups,  $F(3, 124) < 1$ . In addition, the interaction between these factors was non-significant,  $F(6, 124) < 1$ . Tukey HSD post-hoc tests showed that significant differences between the obstacles related to the woman and the society,  $q = 5.08$ ,  $p < 0.01$ , and between the obstacles related to the family and the society,  $q = 3.96$ ,  $p < 0.05$ , but there were no differences between the obstacles related to the women and family,  $q = 1.12$ .

**Table 7. Obstacles against the rights of disabled females as perceived by the four groups of participants**

	Disabled females		Disabled Males		Non-Disabled females		Non-Disabled males
	M	SD	M	SD	M	SD	M
Obstacles related to the woman	79.2	18.4	79.1	17.6	81.5	12.7	75.4
Obstacles related to the family	78.4	23.4	83.0	19.0	76.2	18.2	75.7
Obstacles related to the society	73.8	24.4	78.1	22.6	72.5	13.9	71.2

## Empowerment

Table 8 demonstrates the descriptive statistics for the ways to enable disabled females to gain their rights as perceived by the four groups of participants. These data were subjected to 4 (groups of participants) x 4 (empowerments) mixed-participant ANOVA. The results showed significant effects for participant groups,  $F(3, 124) = 4.23$ ,  $p = 0.007$ , and empowerment,  $F(3, 124) = 4.95$ ,  $p = 0.002$ . The interaction between these factors was marginally non-significant,  $F(9, 124) = 1.81$ ,  $p = 0.06$ . Table 9 illustrates the results of Tukey HSD post-hoc

tests. Males without a disability acknowledged less the ways of empowerment than the females without a disability. In addition, legislative and political empowerment was considered more important than both social and educational empowerment.

**Table 8. Ways for enabling disabled females to get their rights as perceived by the four groups of participants**

	Disabled females		Disabled Males		Non-Disabled females		Non-Disabled males
	M	SD	M	SD	M	SD	M
Legislative & political empowerment	91.7	21.4	88.4	18.8	91.7	13.9	73.3
Economic empowerment	89.3	25.0	84.6	27.0	91.9	14.7	72.5
Social empowerment	77.8	25.4	84.7	25.4	87.1	16.8	74.0
Educational empowerment	81.5	25.2	79.0	27.5	85.6	18.9	75.3

**Table 9. Post-hoc Tukey Comparisons for the ways of empowerment**

Comparisons	Qs
<i>Groups of participants</i>	
Non-Disabled females vs. Non-Disabled males	4.83**
Non-Disabled females vs. disabled females	1.27
Non-Disabled females vs. disabled males	1.54
Non-Disabled males vs. disabled females	3.56
Non-Disabled males vs. disabled males	3.29
Disabled females vs. disabled males	0.27
<i>Empowerment</i>	
Legislative & political vs. Economic	1.05
Legislative & political vs. Social	4.09*
Legislative & political vs. Educational	4.09*
Economic vs. Social	3.05
Economic vs. Educational	3.05
Social vs. Educational	0.0

Note: \*= p< 0.05; \*\*= p< 0.01; \*\*\*= p< 0.001.

## Discussion

This study examined the human rights of Qatari women with disabilities, the challenges these women face and means of empowerment as perceived by Qatari women and men with or without disabilities. A questionnaire that addressed disabled women's human rights (QRWD) was developed using the CRPD that provide good rates of internal stability and generally strong inter-correlations among sub-scales.

Participants with disabilities were more aware of the human rights of women with disabilities than participants without a disability. In addition, males, especially who had no disabilities, were less aware of some rights of women with disability (social protection, health welfare and personal rights) than women. Together, these findings suggest that, in spite of the attention given to the special-needs population nationally and internationally, women with disabilities still face a "double handicap" economically, socially and politically (Deegan & Brooks, 1985; Schur, 2003; 2004). For this reason, women with disabilities addressed the

obstacles that are related to society more than those that are related to themselves or their families. Consequently, the legislative and political empowerment was considered the most important means of empowerment because it plays a central role in changing the attitudes of the society toward women and disabilities.

Interestingly, however, men with no disabilities best acknowledged the rights of females with disabilities to have a family. This is an unexpected finding since the statistics illustrates very low figures (37.4%) of women with disabilities actually having families in the State of Qatar (Al- Merekhi & Al-Buainain, 2012). This suggests that a change in attitudes may be taking place. On the other hand, females were more aware of the civil and political rights, social protection, health welfare and personal rights than males. These findings may reflect the results of the attention given by the Qatari government to individuals with disabilities. Indeed, the Qatari Supreme Council for Family Affairs organizes many events (e.g., lectures, workshops, and conferences) aimed to establish a culture that respects the human rights of men and women with disabilities. Since all participants in this study were undergraduate students enrolled at Qatar University, almost all participants with disabilities attended these events. This could explain why disabled persons were more aware of their human rights than the non-disabled individuals.

To conclude, this is the first study to examine the human rights of women with disabilities in the Arab-Gulf countries. In one notable study, Nagata (2003) previously examined gender and disabilities in the Arab region. However, unlike the present study that utilized a quantitative approach, Nagata's (2003) study was qualitative. Therefore, the present study is thought to have great contribution for the international literature. Qatar government provides persons with disabilities with great facilities and opportunities. However, women with disabilities still face some complications as perceived by non-disabled persons, especially men.

Therefore, the study recommends developing training programs for enhancing public awareness of the rights of all individuals with disabilities especially women and to enable women with disabilities to realize their rights and gain the knowledge necessary to access available services. Furthermore, there is need for the development of further legislation and laws for the integration of disabled women in various aspects of life.

## References

- Abu-Habib, L. (1997). *Gender and disability. Women's experiences in the Middle East.* Oxford: Oxfam
- Al-Attiyah, A. (2006). Woman with disability: Challenges and aspirations an analytical study , "6<sup>th</sup> form of GOC Gulf committee for disability ,Sultanate of Oman ,27 Feb-1March.
- Al-Attiyah, A. and Nasser, R. (2014). Qatari women's rights in light of the convention on the elimination of all forms of discrimination against women. *The Social Sciences*, 9(2), 91-97.
- Al-Merekhi, N. & Al-Buainain, D. ( 2012). *Statistical overview of individuals with disabilities in the State of Qatar. Qatar.* Doha, Qatar: The Supreme Council for Family Affairs.

- Al-Kassas, M. (2004). Social empowerment for people with special needs. *The second conference of the Arab intellectual disabilities between avoidance and care*, Assiut, Egypt.
- Azaamt, J. (2000). *Vocational rehabilitation for the disabled*. Ammn, Jordan: Dar Agency for printing, publishing and distribution.
- Bailey, D., McWilllam R., Buysse, V., & Wesley, P. (1998). Inclusion in the context of competing values in early childhood education. *Early Childhood Research Quarterly*, 13(1), 27-47.
- Barker,T., and Maralani, V.(1997). *Challenges and Strategies of Disabled Parents: Findings from a National Survey of Parents with Disabilities*. Oakland, CA, Berkeley Planning Associates.
- Bruce, A., Quinlivan, S. & Degener,T. (2002). Gender and disability: The convention of the elimination of all forms of discrimination against women. In G. Quinn & T. Degener (Eds). *Human rights and disability: The current use and future potential of United Nations human rights instruments in the context of disability*. New York and Geneva: United Nations.
- Deegan, M. J. & Brooks, N. A. (1985). *Women and disability: The double handicap*. New Brunswick, New Jersey: Transaction Books.
- DeWees, M. (2006). *Gender, economics, and crime: Exploring the effect of women's economic marginalization and the patriarchal capitalist structure on female offending*. Gainesville, FL: University of Florida Press.
- Farouk, M. (2001). NGOs policies in support of education of the poor. Cairo: *National Center for Social and Criminological Research*.
- Ferri, B.A., & Gregg, N. (1998). Women with disabilities: Missing voices. *Women's Studies International Forum*, 21(4), 429-439.
- Fiduccia, B. F. W., & Wolfe, L. (1999). *Women and Girls with Disabilities: Defining the Issues (The Barbara Waxman Fiduccia Papers on Women and Girls with Disabilities)*. Washington DC: Center for Women Policy Studies.
- Frohmader, C. & Meekosha, H. (2012). Recognition, respect and rights: Women with disabilities in a globalised world. In D. Goodley, B. Hughes & L. Davis (Eds). *Disability and Social Theory*. London: Palgrave Macmillan.
- Gaad, E. (2004). Cross-cultural perspectives on the effect of cultural attitudes towards inclusion for children with intellectual disabilities. *International Journal of Inclusive Education*, 8(3), 311-328.
- Hassan, S. (2011). The role of civil societies in the reduction of social exclusion directed against women with disabilities. *Faculty of Social Work, Assiut University*.
- Hassanein, E. (2015). *Inclusion, disability and culture*. Rotterdam: Sense Publishers.

- Jones, D. and Webster, L. (2006). *A handbook on Mainstreaming Disability*. London: VSO.
- Mustafa, M. (2004). Obstacles that limit women's access to social rights in civil society organizations. *Fifteenth Scientific Conference, Faculty of Social Work*, University of Cairo, Fayoum branch.
- Nagata, K. K. (2003). Gender and disability in the Arab region: The challenges in the new millennium. *Asia Pacific Disability Rehabilitation Journal*, 14, 10-17.
- Qatar Vision (2030). *General Secretariat for Development Planning*. Doha, Qatar. Retrieved from [www.gsdp.gov.qa](http://www.gsdp.gov.qa)
- Rauzon, T. (2002). Barriers to participation in physical activity exercise for women with physical disabilities. *PHD Thesis, the University of Utah*.
- Rousso, H. (2001). *Strong Proud Sisters. Girls and Young Women with Disabilities*. Washington, DC: Center for Women Policy Studies.
- Rousso, H. (2003). *Education for all: A gender and disability perspective*. Paris: UNESCO.
- Santos, S. (2008). Brazilian Black women's NGOs and their struggles in the area of sexual and reproductive health: Experiences, resistance, and politics. PhD thesis, *The University of Texas at Austin*.
- Schur, L. (2003). Contending with the 'double handicap': Political activism among women with disabilities. *Women in Politics*, 25, 31-62.
- Schur, L. (2004). Is there still a 'double handicap'? Economic, social, and political disparities experienced by women with disabilities. In B. G. Smith & B. Hutchison (Eds). *Gendering Disability*. New Brunswick, New Jersey: Rutgers University Press.
- UN Committee on Economic, Social and Cultural Rights (CESCR) (2005). *General Comment No. 16: The Equal Right of Men and Women to the Enjoyment of All Economic, Social and Cultural Rights (Art. 3 of the Covenant)*, 11 August 2005.

## Evaluation of the Student Experience in the Co-taught Classroom

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### Abstract

*Co-teaching is the fastest growing inclusion model in the United States. Yet, the effectiveness of this model from the student perspective is largely under researched. Over a six-week period of systematic implementation of co-teaching models, this study quantitatively compared student and teacher perceptions of the effectiveness of the five most commonly used co-teaching models (i.e., One Teach/One Assist, Station Teaching, Alternative Teaching, Parallel Teaching, and Team Teaching). Quantitative analyses demonstrated statistical interactions between student and teacher perceptions. These findings differ from previous research in that they focus primarily on student perceptions in order to gain a better understanding of the impacts of co-teaching on students.*

**Keywords:** *Co-teaching models, effectiveness, secondary education, inclusion, teaching methodology, perceptions*

### Introduction

Co-teaching is defined as two licensed educators (one general educator and one special educator) collaboratively plan, teach and assess a diverse group of students. Its use allows students with disabilities consistent access to the general education curriculum via the content knowledge of the general educator and continuous specialized support via the special educator. Since 1995, it is the fastest growing inclusion model (Cook & Friend, 1995; Kloo & Zigmond, 2008; Murawski, 2009; Volonino & Zigmond; 2007) as it creates a highly effective service delivery option for both academic instruction and growth of students with disabilities. Simultaneously, it retains the integrity of the least restrictive environment as guaranteed by *The Education for All Handicapped Children Act (EAHCA)* and upheld by the Individuals with Disabilities Education Act (Conderman, 2011; Dieker, 2001; Dieker & Berg, 2002, IDEA, 2004). Developing the effectiveness of the co-taught classroom is crucial in an effort to facilitate the inclusion of students with special

educational needs and disabilities in the general education classrooms.

### **Benefits of Co-teaching**

Six co-teaching models have been discussed and studied extensively and are currently utilized in co-taught classrooms (Cook & Friend, 1995; Fenty & McDuffie-Landrum, 2011; Forbes & Billet, 2012; Hepner & Newman, 2010; Nichols, Dowdy, & Nichols, 2010; Sileo, 2011). These include: (1) One Teach/One Observe, (2) One teach/One Assist, (3) Station Teaching, (4) Parallel Teaching, (5) Alternative Teaching, and (6) Team Teaching. For this study, One Teach/One Observe model was discarded because of a lack of interaction between the observing teacher (i.e., the special educator) and primary instructor (general educator). Previously, educators have postulated that co-teaching has value not only for students, but for themselves as well. It has been reported that co-teaching improves student academic performance, behavior, and self-confidence (Hang & Rabren, 2009; Idol, 2006; Rabren, 2002; Walther-Thomas, 1997) while also providing teachers professional growth, behavior support, classroom management support, and opportunities for collaboration (Austin, 2001; Dieker, 2001; Fenty & McDuffie-Landrum, 2011; Forbes & Billet, 2012; Keefe & Moore, 2004; Kohler-Evans, 2006; Patel & Kramer, 2013; Scruggs, Mastropieri, & McDuffie, 2007). Although research suggests a co-taught classroom should be a highly effective means of access to the general education curriculum for students with disabilities, research also suggests the co-taught paradigm is plagued with detrimental issues (Anderson & Speck, 1998; Austin, 2001; Keefe & Moore, 2004; Kohler-Evans, 2006; Patel & Kramer, 2013).

### **The Issues with Co-teaching**

Although the co-taught classroom should be the best possible environment for students with disabilities based on the combined talent, knowledge, and experience of the educators; this is not always the case. There are deterrents to the potential success of the co-taught classroom that are differentiated into two categories, structural and perceived.

#### **Structural Deterrents**

Defined for this paper, structural deterrents for co-teachers include those elements of the school system out of direct teacher control. For example, a lack of time in the school day for co-planning, pairing the best possible co-teaching teams together, and a lack of professional development for co-teachers are all structural issues (Cook & Friend, 1995; Murawski, 2009). Although these have an undeniable impact on the co-teacher success, they have potential remedies. For example, co-teachers may take advantage of various forms of communication technology (e.g. - text, Skype, Google Hangout, and email) in an effort to co-plan. Furthermore, in an effort to more effectively pair co-teaching partners a protocol for co-teacher responsibility determination can be implemented to facilitate a productive year. Lastly, professional development can be easily acquired and is widely available online for free and can be accessed directly through available school computing.

#### **Perceived Issues**

Unfortunately, not all issues are easily remedied. Co-teacher perceived issues are inclusive of items such as personality conflicts, lack of confidence in content or differentiation strategies, unbalanced classroom management responsibilities, teaching philosophy differences, differences in teaching styles, feeling of being undervalued, effective planning, unbalanced authority between teachers, and differences in grading (Alvarez-McHatton & Daniel, 2008; Anderson & Speck, 1998; Forbes & Billet, 2012; Keefe & Moore, 2004; Harbort, et al., 2007; Kohler-Evans, 2006; Murawski, 2009; Murawski & Lochner, 2010; Murawski & Swanson, 2001; Patel & Kramer, 2013; Volonino & Zigmond, 2007; Zigmond & Matta, 2004). These issues are commonly experienced by co-teaching partners and often personal. Unfortunately, when these

issues occur a co-teaching classroom can quickly become ineffective. However, by understanding students and how they respond to these perceived issues co-teachers can begin to successfully navigate some of these concerns that are associated with co-teaching.

There has been an abundance of research from the perspective of the teacher, but little is known about how students perceive their experiences in the co-taught classroom when a variation of models is implemented into the instructional process (Anderson & Speck, 1998; Austin, 2001; Keefe & Moore, 2004; Kohler-Evans, 2006; Patel & Kramer, 2013). Therefore, this project expanded the current literature associated with co-teaching to explore student perceptions as it relates to the above referenced structural and perceived issues that are common co-teaching partner concerns in an effort to also understand the student experience in the co-taught classroom as students were exposed to various co-teaching models.

## Methods

This study was designed to ascertain teacher and student perceptions of common co-teaching issues as reported by co-teaching partners using the (1) variation of co-teaching models over a 6-week period by co-teaching partners; (2) administration of the student survey (Table 1); and (3) administration of the teacher survey (Table 2). The overall research question of this study: Are there perceived differences (among students, among teachers, between students and teachers) across the five co-teaching models introduced previously?

**Table 1. Student rubric utilized in the current study**

	<b>Classroom Management</b>	<b>“X” One</b>
5	The teachers presented themselves as equal partners with regard to discipline and answering student questions.	
4	The teachers mostly presented themselves as equal partners with regard to discipline and answering student questions.	
3	Some of the time one teacher would answer student questions and manage discipline while the other teacher would teach the class.	
2	Most of the time one teacher was in charge of answering student questions and managing discipline while the other teacher taught the class.	
1	One teacher answered student questions and disciplined students while the other teacher taught the class.	
	<b>Teaching Model</b>	<b>“X” One</b>
5	Both teachers presented new material to the class.	
4	For the most part, both teachers presented new material to the class.	
3	Some new information was provided by one of my teachers, but most new information came from the other teacher.	
2	Very little new information was presented by one of my teachers.	
1	New material was presented to the class by one teacher.	
	<b>Teacher Confidence</b>	<b>“X” One</b>
5	I can ask both of my teachers about what we are learning and I know they will both be able to help me.	
4	I am fairly certain both of my teachers can answer any question I may have about the material we are learning.	
3	I am not sure both of my teachers can answer any question I may have about the material we are learning.	
2	I am fairly certain I cannot ask one of my teachers a question about the material we are learning.	

1	I know that one of my teachers cannot answer a question I may have about the material we are learning.	
	<b>Behavior</b>	<b>“X” One</b>
5	My behavior was much better because of the teaching style and the activities.	
4	My behavior was better than normal because of the teaching style and the activities.	
3	My behavior was somewhat better than normal because of the teaching style and the activities.	
2	My behavior was not that much better than normal because of the teaching style and the activities.	
1	This style of teaching had NO impact on my behavior. I was like I always am in class.	
	<b>Learning</b>	<b>“X” One</b>
5	This style of teaching helped me to understand 90-100% of the lessons.	
4	This style of teaching helped me to understand 80-89% of the lessons.	
3	This style of teaching helped me to understand 70-79% of the lessons.	
2	This style of teaching helped me to understand 60-69% of the lessons.	
1	This style of teaching helped me to understand less than half of the lessons.	
	<b>Student Confidence</b>	<b>“X” One</b>
5	After the last two lessons and teaching style I feel confident that I could answer any question about the material.	
4	After the last two lessons and teaching style I feel mostly confident that I could answer any question about the material.	
3	After the last two lessons and teaching style I feel somewhat confident that I could answer any question about the material.	
2	After the last two lessons and teaching style I do not feel very confident about answering questions about the material.	
1	I don't feel like I learned much over the last two days and I hope my teacher does not ask me a question about the material.	
	<b>Teacher Authority</b>	<b>“X” One</b>
5	Over the last two days it seemed that both of my teachers have the same amount of power in the classroom.	
4	Over the last two days it seemed that, for the most part, both of my teachers have the same amount of power in the classroom.	
3	Over the last two days it seemed that one of my teachers may have had a little more power than the other teacher.	
2	Over the last two days one of my teachers seemed more powerful than the other teacher.	
1	Over the last two days it is obvious that one of my teachers is more powerful than the other teacher.	

**Table 2. Teacher rubric utilized in the current study**

	<b>Classroom Management</b>	<b>“X” One</b>
5	We presented ourselves as equal partners with regard to discipline and answering student questions.	
4	We mostly presented ourselves as equal partners with regard to discipline and answering student questions.	
3	Some of the time one of us would answer student questions and manage discipline while the other would teach the class material.	
2	Most of the time one of us was in charge of answering student questions and managing discipline while the other taught the class.	
1	One teacher answered student questions and disciplined students while the other teacher	

	taught the class.	
	<b>Teaching Model</b>	<b>"X" One</b>
5	Both teachers presented new material to the class	
4	For the most part, both teachers presented new material to the class.	
3	Some new information was provided by one of us, but most new information came from my partner.	
2	Almost all new information came from my partner while I added a few things here and there.	
1	New material was presented to the class by one teacher.	
	<b>Learning</b>	<b>"X" One</b>
5	It seemed as though this style of teaching helped my students to understand 90-100% of the material covered.	
4	It seemed as though this style of teaching helped my students to understand 80-89% of the material covered.	
3	It seemed as though this style of teaching helped my students to understand 70-79% of the material covered.	
2	It seemed as though this style of teaching helped my students to understand 60-69% of the material covered.	
1	It seemed as though this style of teaching helped my students to understand less than half of the material covered.	
	<b>Behavior</b>	<b>"X" One</b>
5	As a result of the model used, student behavior improved significantly compared to normal behavior.	
4	As a result of the model used, student behavior improved compared to normal behavior.	
3	As a result of the model used, student behavior seemed to improve compared to normal behavior.	
2	As a result of the model used, student behavior didn't really seem to improve as compared to normal behavior.	
1	As a result of the model used, student behavior did not improve at all and may have gotten worse compared to normal behavior.	
	<b>Student Confidence</b>	<b>"X" One</b>
5	I feel very confident that any student could answer questions about the material we have covered in the last two lessons.	
4	I feel confident that any student could answer questions about the material we have covered in the last two lessons.	
3	I feel somewhat confident that any student could answer questions about the material we have covered in the last two lessons.	
2	I do not feel confident that any student could answer questions about the material we have covered in the last two lessons.	
1	I don't feel like the students could confidently answer questions about the content that we have covered in the last two lessons.	
	<b>Teacher Authority</b>	<b>"X" One</b>
5	Over the last two lessons neither teacher appeared to have any more authority than the other teacher.	
4	Over the last two lessons both teachers mostly appeared to have the same amount of authority.	
3	Over the last two lessons my co-teacher may have appeared to have more authority than me.	
2	Over the last two lessons it appeared that I had less authority than my co-teacher.	
1	Over the last two lessons it appeared that I had no authority in the classroom.	

## Selection of Participants

Upon Institutional Review Board (IRB) and local school district approval of the study, an overview was presented to co-teaching teams ( $n=5$ ) at the participating school. Following the provision of written consent by all teachers ( $n=9$ ), pre-data collection observations of the co-teaching partners were conducted to assess current teaching practices and potential for carrying out the proposed study. To assess reliability parameters during these observations, an inter-rater was utilized for 20% of the observations with a 100% agreement. Additionally, one special educator was paired with two participating general educators accounting for the uneven participant numbers (i.e, 5 co-teaching teams and 9 co-teachers). The demographic breakdown of teachers was such that there were five general education, two special education and two dual certified teachers. The average teaching experience was 18.77 years across all teacher participants with an average of 4.55 years of co-teaching experience. Additionally eight teacher participants held some form of Master's degree and three were national board certified. Following the initial teacher observations, student assent and parental consent forms were distributed to students in the co-taught environments ( $n = 177$ ). Only those students that returned both signed forms participated in the study ( $n=122$ ). A summary of demographics for the school district, participating school building, and participants is displayed in Table 3.

**Table 3. Demographics for School District, Participating Building, and Participants**

Characteristic	School District (Total & %)	School Building (Total & %)	Participants (Total & %)
<b>Placement</b>	N = 9,346	N = 633	N=122
Special Education	1,100 (11.65%)	106 (16.75%)	40 (32.78%)
General Education	7,360 (77.93%)	527 (83.25%)	82 (67.21%)
Gifted and Talented	886 (9.38%)	68 (10.74%)	0
<b>Race/Ethnicity</b>			
Asian	428 (4.53%)	15 (2.37%)	0
African American	1,126 (11.92%)	118 (18.64%)	23 (18.85%)
Hawaii/PI	57 (0.60%)	4 (0.63%)	0
Latino	961 (10.18%)	98 (14.85%)	19 (15.57%)
Native American	105 (1.11%)	4 (0.63%)	1 (0.819%)
Caucasian	6,767 (71.75%)	398 (62.88%)	76 (62.29%)
<b>Gender</b>			
Female	4,663 (49.38%)	306 (48.34%)	56 (45.90%)
Male	4,781 (50.62%)	327 (51.66%)	66 (54.09%)
<b>Meal Status</b>			
Free Lunch	3,180 (33.67%)	283 (44.71%)	67 (54.91%)
Reduced Lunch	622 (6.59%)	6.59	
Full Paid	5,642 (59.74%)	59.74	

## Selection of Instruments

The rubrics utilized were initially created for a pilot study conducted during the 2012-2013 academic school year (Burks-Keeley & Brown, 2014). Following examination of the results of this pilot study, consultation of previously validated rubrics in the available co-teaching literature and Frye test for readability analysis (Adams, Cessna, and Friend's (1993) Colorado Assessment of Co-teaching (Co-ACT), Conderman (2011) student survey), the current rubrics were edited such that; (1) the number of categories assessed was decreased, (2) the rubric language was adjusted to increased student accessibility for those students with reading disabilities, and (3) there was an increased complimenting of content instruction. Following these edits, the revised rubrics were validated by three (3) experts in the field of special education. The final student and teacher co-teaching rubrics were designed to measure the opinions of participants, using a one to five Likert-type Scale, in the areas of (1) classroom management, (2) teaching model, (3) teacher confidence, (4) learning, (5) behavior, (6) student confidence, and (7) teacher authority.

## Design and Procedures

The study spanned a 6-week period to facilitate implementation mimicking the realistic experiences of co-teachers, taking into consideration various obligations pulling co-teachers out of the classroom or causing other inconsistencies in co-teaching model implementation. Therefore, co-teachers were allotted 6 weeks to implement all 5 models, with the extra week serving as a “*safety net*” in case teachers were not able to use a model during one week of the study. At the onset of the 6-week period co-teaching partners were asked to plan and schedule for the implementation of the five co-teaching models for two consecutive days and each partnership recorded their dates of implementation on a master schedule.

Class periods during the study were 54 minutes in length providing students with 108 minutes of total exposure to a co-teaching model prior to them completing the rubric (2 classes at 54 minutes each = 108 total minutes of exposure). This decision was made because co-teacher participants in the pilot study reported that the implementation of one co-teaching model continuously over two days was difficult because it did not always complement the content instruction for the entire time frame; therefore, to extend the expectation to three or more days using the same model was unreasonable for the teacher participants and did not mimic a realistic instructional process (Burks-Keeley & Brown, 2014).

Planning sessions were scheduled for each co-teaching partnership in which the researcher assisted in (1) planning the implementation of the 5 co-teaching models, (2) the type of instruction they would incorporate, and (3) the model that they would use for instruction. Co-teaching partners decided among themselves their individual roles and responsibilities while implementing each model without researcher influence. Although assistance was provided to the co-teachers in selecting the co-teaching model(s) best complimenting content instruction, the final selection of the model to be used was ultimately the decision of each co-teaching team. This design did not control for the type of content presented in each lesson, student enjoyment of the subject matter covered during the session, or co-teacher responsibility during the instructional session(s).

During co-teaching model implementation and instructional sessions, a grid observation pattern was used to note co-teaching model characteristics during observations (with an inter-rater 20% of the time and with 100% agreement). Observations took place on both the first and second day of instruction to ensure integrity of the co-teaching model. At the end of day two, coded rubrics were provided to students and teachers, scripted oral instructions and the rubric in its entirety were read aloud, any questions were answered in detail and rubrics were collected following their completion.

## Statistical Analysis

All data were initially analyzed to assess measures of stability and instability within the distribution of responses. Although it is understood that Likert-type data are typically not normally distributed due to them being discrete (non-continuous) and bounded on both the high and low end, the natures of the distributions were assessed to determine both the shape and symmetry of the response distributions in an effort to enhance the interpretation of the results. Following these initial analyses, tests for mean differences were conducted using both a within subject (both student and teacher to themselves) and between subject (student to teacher) repeated measures analysis of variance (ANOVARM). This method of data collection and analysis provided the study with the highest possible magnitudes of statistical power. The probability of committing a Type I error was set at alpha equal to 5% ( $\alpha=0.05$ ) and the probability of committing a Type II error was set equal to 20% ( $\beta = .20$ ). For all data with which significant mean difference results were observed ( $p \leq 0.05$ ), Fisher LSD Post hoc comparison ( $\alpha=0.05$ ) were conducted to identify specific area(s) in which differences were present.

## Results

### Student Responses

#### Stability, instability, symmetry and shape

Results of these initial analyses across all co-teaching models are displayed in Table 4. Overall, response averages for all co-teaching models and categories were observed to fall on the high end of the scale ( $4.67 \geq \geq 3.34$ ) and demonstrated moderate variability ( $2.730 \geq s^2 \geq 0.433$ ) across the student sample. The data also consistently demonstrated a slight negative skew which is common with Likert-type data (Clason & Dormody, 1994). With regard to distributional shape, all student response data were observed to be either leptokurtic or platykurtic depending on either the co-teaching model or observed parameter. There did not appear to be any consistency with regard to distributional shape that was dependent on either co-teaching model or characteristic.

**Table 4. Results of initial stability, instability, symmetry and shape analyses for student response data**

Model	N		s <sup>2</sup>	skewness	kurtosis
One Teach / One Assist					
CM	85	4.08	1.250	-1.377	1.216
TC	85	4.67			
SL	85	4.39	0.455	-0.654	-0.631
SB	85	3.35	2.640	-0.405	-1.450
TA	85	4.40	1.090	-1.698	2.651
TM	85	4.08	1.089	-1.212	1.128
SC	85	4.40	0.433	-0.646	-0.586
Station					
CM	85	4.60	0.610	-1.882	4.463
TC	85	4.49			
SL	85	4.44	0.511	-1.671	5.044
SB	85	3.42	2.72	-0.529	-1.370
TA	85	4.38	0.583	-1.787	5.576
TM	85	4.60	0.485	-2.324	7.759
SC	85	4.38	0.681	-1.384	2.681
Alternative					
CM	85	4.19	0.890	-2.012	4.381
TC	85	4.59			

SL	85	4.27	0.795	-1.288	1.589
SB	85	3.42	2.730	-0.513	-1.408
TA	85	4.29	0.877	-1.421	1.415
TM	85	4.19	1.240	-1.406	1.328
SC	85	4.29	0.591	-0.563	-1.087
Parallel					
CM	85	4.19	1.31	-1.696	2.078
TC	85	4.62			
SL	85	4.25	0.593	-0.780	0.137
SB	85	3.52	2.47	-0.647	-1.134
TA	85	4.13	0.948	-1.656	2.872
TM	85	4.18	1.040	-1.347	1.619
SC	85	4.13	0.828	-1.135	1.667
Team					
CM	85	4.29	0.800	-1.494	2.744
TC	85	4.51			
SL	85	4.26	0.527	-0.633	-0.151
SB	85	3.34	2.44	-0.493	-1.298
TA	85	4.22	0.514	-1.396	1.200
TM	85	4.29	0.761	-1.043	0.259
SC	85	4.22	0.842	-1.221	1.265

Within subject ANOVARM. The results of ANOVARM for within student differences across the co-teaching models indicated no significant difference in student response for Classroom Management ( $p=0.086$ ), Teacher Confidence ( $p=0.348$ ), Learning ( $p=0.137$ ), Behavior ( $p=0.713$ ), and Teacher Authority ( $p=0.054$ ). However; ANOVARM results did indicate an overall main effect in student responses for both Teaching Model ( $F(4,336) = 4.696$ ;  $p=0.001$ ;  $\eta^2 = 0.039$ ;  $1-\beta = 0.95$ ) and Student Confidence ( $F(4,336) = 2.406$ ;  $p=0.049$ ;  $\eta^2 = 0.028$ ;  $1-\beta = 0.69$ ). For those variables returning overall significant values, results of stability, instability, symmetry and shape.

**Table 5. Results of Fisher LSD post hoc testing for student response data**

#### Teacher Responses

Model (i)	Model (j)	$\bar{x}_d$ (i-j)	Sig. (p)	95% C.I	
Lower Bound	Upper Bound				
<i>Teaching Model</i>					
Station	OTOA	0.467	<0.001	0.254	0.680
Teaching	Alternative	0.301	0.006	0.086	0.515
	Parallel	0.292	0.005	0.089	0.495
	Team	0.235	0.014	0.049	0.422
<i>Student Confidence</i>					
Parallel	OTOA	-0.271	0.008	-0.469	-0.073
Teaching	Station	-0.247	0.032	-0.473	-0.022

The results of these initial analyses across all co-teaching models are displayed in Table 6. Unlike student responses, teacher response averages for all co-teaching models and categories were observed to be distributed more widely across the scale ( $4.95 \geq \geq 1.65$ ) and consistently demonstrated lower magnitudes of variability ( $2.205 \geq s^2 \geq 0.053$ ) across the teacher sample. The teacher data also demonstrated both positive and negative skew depending on the model and parameter. With regard to distributional shape, all teacher response data were observed to be leptokurtic or platykurtic depending on the co-teaching model or observed parameter with peak magnitudes of kurtosis being much higher than those observed for the student response data.

**Table 6. Results of initial stability, instability, symmetry and shape analyses for student response data**

Model	N		s2	skewness	kurtosis
One Teach / One Assist					
CM	26	4.73	0.258	-1.925	3.200
SL	26	3.50	1.140	-0.534	-0.241
SB	26	2.42	0.894	1.778	2.938
TA	19	2.63	0.801	-0.702	-0.073
TM	26	1.65	0.555	0.680	-0.818
SC	25	3.24	0.857	0.506	-0.329
Station					
CM	26	4.81	0.642	-4.686	22.641
SL	26	4.12	0.586	-0.204	-1.205
SB	26	2.96	1.798	0.075	-1.175
TA	19	4.58	0.368	-1.168	0.582
TM	26	4.27	2.205	-1.774	1.472
SC	25	3.64	0.490	0.643	-0.641
Alternative					
CM	26	4.62	0.726	-3.332	13.209
SL	26	4.08	0.634	-0.143	-1.377
SB	26	4.00	0.960	-1.382	2.565
TA	19	4.47	1.041	-2.552	7.280
TM	26	4.46	0.498	-0.962	-0.262
SC	25	3.84	0.723	-0.115	-0.723
Parallel					
CM	26	4.92	0.074	-3.373	10.156
SL	26	4.27	0.605	-0.527	-1.108
SB	26	4.08	0.474	-0.099	-0.722
TA	19	4.95	0.053	-4.359	19.000
TM	26	4.73	0.205	-1.105	-0.850
SC	25	3.96	0.623	0.073	-1.351
Team					
CM	26	4.73	0.285	-1.925	3.200
SL	26	4.42	0.414	-0.667	-0.428
SB	26	3.23	1.465	0.106	-1.162
TA	19	4.79	0.175	-1.545	0.419
TM	26	4.69	0.542	-2.691	7.292
SC	25	4.08	0.493	-0.112	-0.816

### Within subject ANOVARM.

The results of ANOVARM for within teacher differences across the co-teaching models were only similar to student response data for non-significance observed with regard to Classroom Management ( $p=0.448$ ). All other variables assessed were observed to differ significantly with regard to teacher perceptions. These results are displayed in Table 7. As with student response data, for those variables returning overall significant values results of follow-up testing to identify between which variables differences could be observed with regard to teacher response data are displayed in Table 8

**Table 7. Overall ANOVA Results**

Source	Type III SS	df	MS	F	p	$\eta^2$	1-B
<i>Teaching Model</i>							
Teacher Perceptions	176.692	4	44.173	53.280	<0.001	0.681	> 0.99
Error	82.908	100	0.829	---	---	---	---
<i>Student Learning</i>							
Teacher Perceptions	12.769	4	3.192	5.146	0.001	0.171	0.961
Error	62.031	100	0.620	---	---	---	---
<i>Student Behavior</i>							
Teacher Perceptions	51.338	4	12.835	13.851	<0.001	0.357	> 0.99
Error	92.662	100	0.927	---	---	---	---
<i>Student Confidence</i>							
Teacher Perceptions	10.382	4	2.708	4.678	0.002	0.163	0.941
Error	55.568	96	0.579	---	---	---	---
<i>Teacher Authority</i>							
Teacher Perceptions	67.432	4	16.858	32.137	<0.001	0.641	> 0.99
Error	37.768	72	0.525	---	---	--	

**Table 8. Results of Post Hoc Analysis for Teacher Comparisons**

Model (i)	Model (j)	$\bar{x}_d$ (i-j)	Sig. (p)	95% C.I	
Lower Bound	Upper Bound				
Teaching Model					
OTOA	Station	-2.615	<0.001	-3.242	-1.989
	Alternative	-2.808	<0.001	-3.220	-2.395
	Parallel	-3.077	<0.001	-3.378	-2.776
	Team	-3.038	<0.001	-3.555	-2.521
Student Learning					

OTOA	Alternative	-0.577	0.033	-1.103	-0.051
Parallel		-0.769	0.003	-1.245	-0.294
Team		-0.923	<0.001	-1.379	-0.467
Student Behavior					
OTOA	Station	-0.538	0.024	-0.999	-0.078
Alternative		-1.577	<0.001	-2.103	-1.051
Parallel		-1.654	<0.001	-2.110	-1.198
Team		-0.808	0.001	-1.235	-0.380
Station	Alternative	-1.038	0.009	-1.792	-0.285
Parallel		-1.115	0.001	-1.745	-0.486
Alternative	Team	0.769	0.009	0.206	1.332
Parallel	Team	0.846	0.006	0.267	1.425
Student Confidence					
OTOA	Alternative	-0.600	0.022	-1.106	-0.094
Parallel		-0.720	0.002	-1.142	-0.298
Team		-0.840	0.001	-1.281	-0.399
Station	Team	-0.440	0.031	-0.837	-0.43
Teacher Authority					
OTOA	Station	-1.947	<0.001	-2.579	-1.315
Alternative		-1.842	<0.001	-2.381	-1.303
Parallel		-2.316	<0.001	-2.772	-1.860
Team		-2.158	<0.001	-2.647	-1.669
Station	Parallel	-0.368	0.015	-0.656	-0.081

## Student and Teacher Response Comparison Analysis

### Interaction Terms

The results of the ANOVARM analyses comparing student and teacher responses indicated that there was no observable interaction for classroom management. However, for all other variables, interactions were observed when comparing student and teacher response data. These results are displayed in Table 9 and Table 10.

**Table 9. Interaction Overall Testing**

Source	Type III SS	df	MS	F	p	$\eta^2$	1-B
<i>Teaching Model</i>							
Perceptions	155.180	4	38.795	48.125	<0.001	0.308	> 0.99
Interaction	120.852	4	30.213	37.479	<0.001	0.258	> 0.99
Error	348.246	432	0.806	---	---	---	---
<i>Student Learning</i>							
Perceptions	7.572	4	1.893	4.547	0.001	0.040	0.943
Interaction	13.157	4	3.289	7.901	<0.001	0.068	0.998
Error	181.527	436	0.416	---	---	---	---
<i>Student Behavior</i>							
Perceptions	45.404	4	11.351	13.726	<0.001	0.112	> 0.99

Interaction	34.016	4	8.504	10.283	<0.001	0.086	>0.99
Error	360.567	436	0.827	---	---	---	---
<i>Student Confidence</i>							
Perceptions	10.382	4	2.708	4.678	0.002	0.163	0.941
Interaction							
Error	55.568	96	0.579	---	---	---	---
<i>Teacher Authority</i>							
Perceptions	67.432	4	16.858	32.137	<0.001	0.641	>0.99
Interaction							
Error	37.768	72	0.525	---	---	---	

**Table 10. Results of Interaction Post Hoc Testing for Students and Teachers**

Model (i)	Model (j)	$\bar{x}_d$ (i-j)	Sig. (p)	95% C.I	
Lower Bound	Upper Bound				
<u>Teaching Model</u>					
OTOA	Station Alternative Parallel Team	-1.564 -1.457 -1586 -1.620	<0.001 <0.001 <0.001 <0.001	-1.853 -1.721 -1.871 -1.913	-1.274 -1.193 -1.301 -1.328
<u>Student Learning</u>					
OTOA	Station	-0.331	0.005	-0.562	-0.100
Alternative	-0.230	0.049	-0.458	-0.001	
Parallel	-0.314	0.003	-0.521	-0.107	
Team	-0.397	<0.001	-0.589	-0.205	
<u>Student Behavior</u>					
OTOA	Station	-0.305	0.037	-0.590	-0.019
Alternative	-0.824	<0.001	-1.125	-0.523	
Parallel	-0.909	<0.001	-1.194	-0.624	
Team	-0.398	0.003	-0.654	-0.142	
Station	Alternative	-0.519	0.002	-0.841	-0.197
Parallel	-0.605	<0.001	-0.888	-0.321	
Alternative	Team	0.426	0.004	0.624	1.194
Parallel	Team	0.511	<0.001	0.242	0.780
<u>Student Confidence</u>					
OTOA	Alternative	-0.247	0.015	-0.446	-0.048
Parallel	-0.225	0.038	-0.437	-0.012	
Team	-0.332	0.002	-0.540	-0.124	
<u>Teacher Authority</u>					
OTOA	Station	-1.097	<0.001	-1.401	-0.793
Alternative	-1.003	<0.001	-1.303	-0.704	
Parallel	-1.205	<0.001	-1.501	-0.909	
Team	-1.244	<0.001	-1.507	-0.981	

## Discussion and Conclusion

With regard to teaching model, the Station Teaching model was perceived by students as more easily recognized when compared to all other co-teaching models. This finding is not surprising because the classroom structure and instructional processes applied for the Station Teaching model are drastically different than what a typical secondary classroom would experience due to the grouping and timed rotations. For practical application, students seem to be mostly oblivious to what structure the classroom takes on unless the change is overly blatant, indicating professional development in the area of co-teaching should place less emphasis on changing up the structure of the classroom for the benefit of the student.

With regard to student confidence, Parallel Teaching model appeared to provide students with higher confidence levels than One Teach/One Assist and Station Teaching. This result, when compared with One Teach/One Assist, is not surprising as previous literature (Volonino & Zigmond, 2007) had indicated the One Teach/One Assist model is ineffective. However, with regard to the comparison with Station Teaching this finding is surprising because both Parallel Teaching and Station Teaching reduce the student to teacher ratio, which has been shown to be a beneficial practice for students (Burks-Keeley & Brown, 2014). For application purposes, in settings where co-teaching teams observe a severe lack of confidence in students with regard to the subject area content, it may be appropriate to consistently utilize the Parallel Teaching model in order to increase student confidence.

While student perceptions contradicted current co-teaching literature, in part, teacher perceptions appeared to be in alignment with current research. For example, teacher perception data revealed a common trend in that it placed One Teach/One Assist as the lowest ranking co-teaching model in every category. This finding is expected, in that professional development that a co-teaching partnership may receive urges co-teaching partners to move beyond One Teach/One Assist to become a more cohesive co-teaching team suggesting that the use of the One Teach/One Assist model is least preferred and less effective (Volonino & Zigmond, 2007).

Teachers also rated the Station Teaching model low in the areas of student behavior, student confidence, and teacher authority preferring Alternative Teaching, Parallel Teaching, or Team Teaching in this area. These ratings could be attributed to the use of an independent group in Station Teaching and the teacher's desire to monitor all student progress closely. This could lead to an uneasy feeling on the part of the teachers in terms of student progress as it relates to the independent group in Station Teaching. In contrast, Alternative Teaching and Parallel Teaching reduce the student to teacher ratio giving the teachers more access to the individual needs of their perspective group, while Team Teaching puts both teachers as lead of the whole group.

Potentially, the most interesting and perhaps impactful findings gleaned from this study were the analysis for interaction data between students and teachers. A visual inspection of mean data illustrates the overall consistent responses of the students while teacher responses fluctuate. With a cursory inspection of data, it is evident that the One Teach/One Assist model is consistently one of the highest ranked models for students, while teachers seem to rate it lowest. In an effort to understand these findings further, each area will be discussed.

Teaching model mean data indicated large differences in the way students and teachers perceived One Teach/One Assist, with students rating it as second highest and teachers rating it lowest. Furthermore, student ratings were mostly consistent across the five models while teacher perceptions indicate a much lower rating for One Teach/One Assist. This result could be attributed to the teachers' insider knowledge of the characteristics of the co-teaching models and they know that by definition, the One Teach/One Assist model requires that one teacher does not present new content instruction to the class. However, this finding is purposeful because co-teachers will, at times, report that their presence in the classroom is pointless when they are not "*teaching*", but here students have indicated that perceived issue is not a factor for them. This could serve as support that

One Teach/One Assist can be an effective model for instruction when used in alternation with other co-teaching models.

Again, with student learning, student and teacher data are closely aligned in terms of Station Teaching, Alternative Teaching, Parallel Teaching, and Team Teaching. However, student and teacher ratings of One Teach/One Assist are starkly different. Here, teachers are suggesting that they don't feel that their students have learned as much when the One Teach/One Assist model is applied and this supports previous co-teaching research (Burks-Keeley & Brown, 2014). Fortunately, the student experience was the complete opposite. This would suggest that teachers should not feel as if their student is unable to learn when One Teach/One Assist co-teaching model is implemented because students indicate that this model has value with regard to their learning.

The category that was the most inconsistent for teachers was student behavior, while student responses were constant across the board. The findings for students are not surprising in that regardless of the model, there are always two teachers in the room and co-teaching research reports that student behavior is better in a co-taught classroom because two teachers are present (Walther-Thomas, 1997). These ratings suggest that teachers may have connected student behavior to the co-teaching models. For example, teachers rated One Teach/One Assist and Station Teaching lowest and both models do not allow for continual monitoring of all students by both teachers. Whereas, Alternative Teaching and Parallel Teaching reduce the student to teacher ratio, allowing for continuous monitoring of a smaller group of students, and then Team Teaching allows for both teachers equal responsibility of classroom management simultaneously (Dieker, 2001; Hepner & Newman, 2010; Magiera & Zigmond, 2005; Sileo, 2011). The encouraging information provided by students is that their behavior remains unchanged, regardless of the co-teaching model being applied. This finding could allow co-teaching partners the opportunity to more comfortably integrate a rotation of teaching models that more appropriately aligns with the curriculum.

Additionally, student confidence was rated and once again a difference between student and teacher responses was found to exist. For this area, student ratings have very little variation, but teachers rated One Teach/One Assist as the weakest model for student confidence. The differences in student and teacher responses imply that teachers may have been influenced by current literature with regard to One Teach/One Assist in that it is suggested that One Teach/One Assist is an overused model. However, One Teach/One Assist is not a lesser co-teaching model, it just should not be the only model that co-teaching partners implement (Murawski, 2009; Volonino & Zigmond, 2007). These results suggest that students found the One Teach/One Assist model to be beneficial to their confidence as compared to the other models.

Lastly, teachers reported that their authority was greatly diminished when One Teach/One Assist was incorporated, however, student responses remained consistent with little variation among their ratings of the models. This result could be attributed to the teacher's inside knowledge of the responsibility and structure of the One Teach/One Assist model (e.g., one teacher is the "*assisting*" teacher and not responsible for instruction). According to the student ratings, the co-teaching model seems to have no connection to how much authority a teacher had in the classroom. Therefore, for practical purposes, co-teaching partners should be prepared to understand that their overall perceived authority in the classroom may not be a function of the co-teaching model. Based on the results of this study, it appears that teacher authority is established elsewhere (e.g., classroom management style, teaching philosophy, rapport with the students, etc.).

The co-teaching model implemented in the co-taught classroom has taken criticism for many of the issues associated with co-teaching (e.g. differing teaching philosophies, personality conflicts, differing classroom management styles, etc.). These data suggest that the model alone may not be at the origin of co-teaching issues. It seems that multiple contributing factors converge to create unsuccessful co-teaching partnerships (i.e, structural issues, perceived issues, lack of co-teaching model variation). This study seems to suggest that all co-teaching models have beneficial qualities when models are varied, especially from the student perspective. This study

provides some narrow insight into the perceptions of students and how that relates to their experience in the co-taught classroom. These findings seem to suggest that by simply applying a variation of co-teaching models then students can experience positive outcomes and experiences in the co-taught classroom.

### **Implications and Further Research**

This research is a beginning step in the argument that the teaching model employed does not diminish the potential for efficacy for the co-teaching classroom, but rather the lack of variation of co-teaching models contributes to an unsuccessful co-taught classroom. Therefore, perhaps the student experience in the co-taught classroom could be related to other factors not inherent in the actual model being implemented, but could be related to other factors either structural, perceived, or lack of variation of co-teaching models. The voice of the student with regard to educational practices is limited, but also critically pertinent and crucial to the further understanding of the co-taught classroom. The findings presented in this study have provided the student with a voice in the co-taught classroom and presents evidence that student perceptions of co-teaching models tend to be consistent with little variation and they tend to rate all co-teaching models positively. This research suggests that the variation of co-teaching models may have more influence on the effectiveness of the co-taught classroom as perceived by students.

This important, potential discovery leads to new questions and avenues for research in the co-taught classroom. If in fact, the co-teaching model, when varied, is not a critical issue for student experiences, then future research efforts should explore the other elements of the co-taught classroom in an effort to improve the student experience. Additionally, long-term, systematic variations of the co-teaching models should be implemented and studied further. Lastly, the research should layer in the academic performance of students in order to measure overall co-teaching effectiveness in an effort to improve the practice overall.

### **References:**

- Alvarez-McHatton, P., & Daniel, P.L. (2008). Co-teaching at the preservice level: Special education majors collaborate with English education majors. *Teacher Education and Special Education*, 31(2), 118-131.
- Anderson, R.S., & Speck, B.W. (1998). Oh what a difference a team makes: Why team teaching makes a difference. *Teaching and Teacher Education*. 14(7), 671-686.
- Austin, V.L. (2001). Teachers' beliefs about co-teaching. *Remedial and Special Education*, 22(4), 245-255.
- Burks-Keeley, R.G., Brown, M.R. (2014). Student and teacher perceptions of the five co-teaching models: A pilot study. *Journal of American Academy of Special Education Professionals*. Fall, 149-185.
- Cook, L., & Friend, M. (1995). Co-teaching: Guidelines for creating effective practices. *Focus on Exceptional Children*, 28(3), 1-16.
- Conderman, G. (2011). Middle school co-teaching: effective practices and student reflections. *Middle School Journal*, 42(4), 24-31.

Dieker, L.A. (2001). What are the characteristics of “effective” middle and high school co-taught teams for students with disabilities? *Preventing School Failure, 46*, 14-23.

Dieker, L., & Berg, C. (2002). Collaborative program development between secondary Science, Mathematics, and special educators. *Teacher Education and Special Education, 25*(1), 92-99.

Fenty, N., & McDuffie-Landrum, K. (2011). Collaboration through co-teaching. *Kentucky English Bulletin, 60*(2), 21-26.

Forbes, L., & Billet, S. (2012). Successful co-teaching in the Science classroom. *Scope, 36*(1), 61-64.

Hang, Q., & Robren, K. (2009). An examination of co-teaching: Perspectives and efficacy indicators. *Remedial and Special Education, 30*(5), 259-268.

Harbort, G., Gunter, P.L., Hull, K., Brown, Q., Venn, M.L., Wiley, L.P., & Wiley, E.W. (2007). Behaviors of teachers in co-taught classes in a secondary school. *Teacher Education and Special Education, 30*(1), 13-23.

Hepner, S., & Newman, S. (2010). Teaching is teamwork: preparing for, planning, and implementing effective co-teaching practice. *International Schools Journal, 29*(2), 67-81.

Idol, L. (2006). Toward inclusion of special education students in general education: A program evaluation of eight schools. *Remedial and Special Education, 27*(2), 77-94.

Individuals with Disabilities Act of 1997, § 1400 et. seq.; 34 C.F.R. § 300 et. seq.

Keefe, E. B., & Moore, V. (2004). The challenge of co-teaching in inclusive classrooms at the high school level: What the teachers told us. *American Secondary Education, 32*(3), 77-88.

Kloo, A., & Zigmond, N. (2008). Co-teaching revisited: Redrawing the blueprint. *Preventing School Failure, 52*(2), 12-20.

Kohler-Evans, P. (2006). Co-teaching: How to make this marriage work in front of the kids. *Education, 127*(2), 260-264.

Murawski, W.W., & Lochner, W.W. (2010). Observing co-teaching: What to look for, ask for, and listen for. *Intervention in School and Clinic, 46*(3), 174-183.

Murawski, W.W.,& Swanson, H.L. (2001). A meta-analysis of co-teaching research: Where are the data? *Remedial and Special Education, 22*(5), 258-267.

Murawski, W.W. (2009). *Collaborative teaching in secondary schools: Making the co-teaching marriage work!* Thousand Oaks, CA: Corwin.

Nichols, J., Dowdy, A., & Nichols, C. (2010). Co-teaching: An educational promise for children with disabilities or a quick fix to meet the mandates of No Child Left Behind? *Education, 130*(4), 647-651.

No Child Left Behind Act of 2001, PL 107-110, 115 Stat. 1425, 20 U.S.C. 11 6301 et seq.

- Patel, N.H., & Kramer, T.A. (2013). Modeling: Collaboration for middle-level teacher candidates through co-teaching. *The Teacher Educator*, 48, 170-181.
- Scruggs, T. E., Mastropieri, M. A., & McDuffie, K. A. (2007). Co-Teaching in Inclusive Classrooms: A Metasynthesis of Qualitative Research. *Exceptional Children*, 73(4), 392-416.
- Sileo, J. M. (2011). Co-teaching: Getting to know your partner. *Teaching Exceptional Children*, 43(5), 32-38.
- Volonino, V., & Zigmond, N. (2007). Promoting research-based practices through inclusion? *Theory Into Practice*, 46(4), 291-300.
- Walsh, J. M., & Jones, B. (2004). New Models of Cooperative Teaching. *Teaching Exceptional Children*, 36(5), 14-20.
- Walther-Thomas, C.S. (1997). Co-teaching experiences: The benefits and problems that teachers and principals report over time. *Journal of Learning Disabilities*, 30(4), 395-407.
- U.S. Department of Education. (2002). *Twenty-fourth annual report to congress on the implementation of the individuals with disabilities education act*. Washington, DC: Office of Special Programs and Rehabilitative Services.
- Zigmond, N., & Matta, D. (2004). Value added of the special education teacher in secondary school co-taught classes. In T.E. Scruggs & M.A. Mastropieri (EDS.), *Secondary interventions: Advances in learning and behavioral disabilities* (Vol. 17, pp. 57-78). Oxford, UK: Elsevier Science/JA.

## A Study of Co-Teaching Identifying Effective Implementation Strategies

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### **Abstract**

*Co-teaching models have been established in research as an instructional delivery method to provide instruction to diverse students in an inclusive general education setting. Research of inclusive classrooms where general education and special education teachers co-instruct indicates learning for students with learning disabilities (LD) is improved (Cramer, Liston, Nevin & Thousand, 2010). Co-teaching models have been addressed in the literature, however, responsibilities of general and special education teachers regarding co-planning, co-instruction and co-assessing to implement co-teaching effectively requires further investigation (Mastropieri et al., 2005). This qualitative study investigated two co-taught elementary classrooms. The case study examined information from teachers in reading and math co-taught classrooms to document method of implementation and to gain insight into participants' knowledge and perceptions of co-teaching. Information was gathered from two elementary general education and two elementary special education teachers concerning co-teaching roles, collaborative, instruction, and assessment. Data were gathered utilizing interviews,*

*rating scales, and classroom observations. The experience of elementary co-teachers in co-taught classrooms provided descriptive data allowing examination and analysis of co-teachers' knowledge, perceptions and implementation of co-teaching. Results indicate teachers lack expertise in implementing collaborative co-planning, co-instructing and co-assessing to effectively implement co-teaching. The study identified recommendations for administrative support and teacher training.*

**Keywords:** *co-teaching, students with learning disabilities*

## Introduction

The Individuals with Disabilities Education Act (IDEA) (2004) mandated that students with disabilities be given access to, be involved in, and make progress in the general education curriculum. In addition, the National Center for Learning Disabilities (NCLD) supported the charge of ensuring students with disabilities access to the general education curriculum through advocating for research-based strategies and accountability (Cramer, Liston, Nevin, & Thousand, 2010). Co-teaching was not required as a method of instruction by this legislation, however, growing accountability for teachers to increase the performance of students in the classroom, to produce students prepared for postsecondary placement, and to provide instruction to diverse students elevated co-teaching as a strategy to assist in meeting these goals. Requiring teachers to cover the core curriculum and to guarantee students are acquiring the content has led to implementing strategies such as co-teaching in general education classrooms (Vaughn & Bos, 2015). Research in secondary schools supports co-instruction as an effective method for teachers to provide a diversified classroom with engaging and differentiated instruction (Murawski & Lochner, 2010), however, there are a limited number of co-teaching research studies that focused on elementary schools (Tremblay, 2013). This article describes a study of an elementary school's implementation of co-teaching based on teacher rating scales, interviews and classroom observations.

In 2015, the U.S. Department of Education reported 63 percent of students receiving special education services spent 80 percent of the school day in general education classes, versus 58 percent in 2009 (Wu, 2012; Digest of Education Statistics, 2015). According to the

Annual Disability Statistics Compendium report (2015), 86.4% of special education students in Texas ages 6 to 21 were served more than 40 percent of the instructional day in a general education setting. As students' with disabilities placement in the general education classrooms increase, effective instructional practices require teachers to support all student needs for positive achievement results (McLeskey, Landers, Hoppey & Williamson, 2011). Placing students with disabilities in general education classrooms where teachers are expected to cover the core curriculum and ensure all students are acquiring the content has resulted in schools turning to the current research to implement supportive instructional strategies such as co-teaching in general education classrooms (Vaughn & Bos, 2015). Co-teaching research has identified successful methods of implementing co-teaching within their classrooms (Friend, Cook, Hurley-Chamberlain, & Shamberger, 2010; Kim, Woodruff, Klein, & Vaughn, 2006; Kohler-Evans, 2006; Mastropieri, Scruggs, Graetz, Norland, Gardizi, & McDuffie, 2005; Murawski & Lochner, 2010; Ploessl, Rock, Schoenfield, & Blanks, 2010; Rea & Connell, 2005; Thousand, Villa, & Nevin, 2006). Consequently, co-teaching has been met with considerable support from schools as a successful instructional method incorporating partnerships among general and special educators to meet the needs of special education students (Murawski & Lochner, 2010).

The high level of expectation for students with disabilities to be served in the least restrictive environment in a general education setting has resulted in public schools implementing co-teaching strategies based on the research indicating positive results of the co-teach model as a key component to enhance success for all students in general education classrooms (Cramer et al., 2010; Murawski & Lochner, 2010). Co-teaching embraces student individuality allowing students with different learning styles and needs to receive instruction in a general education classroom. All students benefit from additional instructional support from two teachers in addition to increased involvement and enrichment of students with disabilities in the general education classroom (Mastropieri et al., 2005).

## Co-Teaching

Co-teaching models have been widely discussed in the literature, however, exact responsibilities of general and special education teachers in a co-teaching setting and the appropriate way to measure effective co-teaching require further investigation (Mastropieri et al., 2005). Friend (2008) defines co-teaching as a general education teacher and special education teacher providing instruction to general and special education students in a general education classroom. Research supports findings that instruction has improved with general education and special education teachers educating students in one classroom and supplementing with aids and services to students with disabilities (Cramer et al., 2010).

Research describes the following co-teaching methods, noting that one approach is not more appropriate than the other, instead teachers should determine the instructional model dependent upon the content to be taught (Friend, 2008; Thousand et al., 2006). Both Thousand et al. (2006) and Friend (2008) identified co-teaching models with similar strategies, however, for this study, this school attempted to implemented the Friend & Bursuck (2009) model based on some limited prior teacher training.

Friend and Bursuck (2009) defined the research-based co-teaching models. These models include: 1) one teach, one observe involves one of the co-teachers leading large-group instruction while the other teacher gathers academic, behavioral, or social data on specific students or the class group; 2) station teaching involves dividing students into three groups and rotating the groups from station to station taught by the co-teachers at two stations and working independently at the third; 3) parallel teaching requires each of the co-teachers to instruct half of the students presenting the same lesson in order to provide instructional differentiation and increased student participation; 4) alternative teaching involves one teacher providing instruction to the majority of students while the other teacher works with a small group for remediation, enrichment or assessment; 5) teaming requires the co-teachers lead large-group instruction by both lecturing, representing different viewpoints and multiple methods of solving problems; and 6) one teach, one assist, also identified as supportive teaching, involves one co-teacher leading instruction while the other teacher circulates among the students providing individual assistance (Friend & Bursuck, 2009). Supportive teaching and parallel teaching were identified as the most widely used co-teaching models because they require less organization and collaboration (Friend & Bursuck, 2009; Thousand, Villa, & Nevin, 2006). Scruggs et al. (2007) reported the one teacher, one assist model was most frequently implemented in elementary classrooms.

In order to experience positive results implementing models of co-teaching, research there are crucial steps within the models requiring effective collaboration utilizing both the general and special education teacher strengths (Rea & Connell, 2005). Research suggests,

teachers not only require expert knowledge of the co-teach models, the co-teachers must obtain skills in the ability to collaborate to implement the research-based co-teaching models through effective co-planning, co-instructing, and co-assessing (Murawski & Lochner, 2010). Co-planning requires teachers to create lesson plans together and determine the appropriate accommodations and modifications for special education students. Co-instructing requires teachers to implement the best delivery model for co-teaching the content. Co-assessing requires teachers to work together to provide appropriate assessments to monitor progress of both the general and special education students.

Co-planning is the initial step to effective co-teaching and is essential to ensure co-teachers delineate their roles and method of co-teaching instruction to best meet the lesson goals. (Murawski & Lochner, 2010; Ploessl et al., 2010). To accomplish this in a busy schedule, teachers may plan via technology tools such as Skype or other meeting media outlets utilizing an agenda to ensure an efficient use of time. Most importantly, lesson plans should be designed by co-teachers to determine the delivery model (Ploessl et al., 2010). Co-planning assures both teachers understand their roles and responsibilities regarding each lesson prior to co-instructing in the classroom. Co-instructing involves teachers providing the instruction based on the most appropriate co-teaching model that aligns with the curriculum requirements and student needs. Co-instruction is the responsibility of both teachers and can only be accomplished after careful co-planning to establish a clear understanding of the instructional goal and appropriate co-teach model. Formative and summative assessment must be included in the co-planning and co-instructing steps to determine student progress. The general and special education teacher both assess student progress routinely regardless of the planned method of co-instruction. During the planning step, the method of assessment is determined to monitor student progress. Implementing these components in co-teaching provides a supportive and engaging learning environment for both general and special education students (Ploessl et al., 2010).

Current research reflects the best practices for models of co-teaching and even though extensive research has led to the use of co-teaching in classrooms, an understanding of how co-teachers are implementing the strategies in the classroom is relevant to providing improved teacher and student support (Mastropieri et al., 2005). This study of co-teachers and their strategies utilized to implement co-teaching will facilitate efforts to better understand and improve co-teaching practices. This study and data analysis provides further insight into the collaborative effort of co-teachers and the extent co-planning, co-instructing and co-assessing are integrated into the co-teaching models utilized in elementary classrooms.

## Method

This qualitative descriptive case study investigated two co-taught elementary classrooms. The case study examined information from teachers in reading and math classrooms to gain insight into participants' knowledge and perceptions of co-teaching. Information was gathered from two elementary general education and two elementary special education teachers concerning co-teaching roles and collaborative planning, instruction and assessment using interviews, a rating scale, and classroom observations. The experience of elementary co-teachers in co-teach classrooms provided descriptive data allowing examination and analysis of co-teachers' knowledge, perceptions and implementation of co-teaching to address the following questions: 1) How do co-teachers implement research-based co-teach models and collaborative strategies? 2) How are teacher roles reflected in the co-teaching

partnership? 3) How does administrative support for implementing co-teaching impact co-teachers?

A rating scale, interview, and classroom observation of the participants were the data sources. The qualitative rating scale survey was used to glean practical and relevant information instead of a quantitative rating scale due to the small sample size (Jensen, 2010; Kelley, Clark, Brown, & Sitzia, 2003). Semi-structured interviews allowed for the researcher to gain in-depth knowledge of teacher perceptions of co-teaching from the open-ended questions asked (DiCicco-Bloom & Crabtree, 2006; Hoepfl, 1997). The observation viewed participants delivering instruction in a co-teach classroom (Hopefl, 1997). Themes and subthemes were identified from the rating scales, interviews and observations to determine if teachers' practices reflected their knowledge and conversations regarding co-teaching.

## **Participants and Setting**

The participants consisted of one special education teacher and one general education teacher from the fourth grade mathematics classroom and one special education teacher and one general education teachers from the fifth grade reading classroom. The setting was a fourth and fifth grade elementary school with a total student population of 573. The school principal disseminated the recruitment letter and description of the study to teachers implementing co-teaching in the reading and math classrooms. The teachers willing to participate in the study contacted the researcher via email. Two general education teachers responded and two special education teachers responded to the email. This resulted in two sets of co-teaching partners, one from a fifth grade reading classroom and one from a fourth grade mathematics classroom. The participants chose pseudonyms to ensure anonymity.

The fourth grade math co-teachers were Cindy and Christi. Cindy was a fourth grade general education mathematics and science teacher. She co-taught with Christi in mathematics for one class. At the time of this study, she had taught at the school for twelve years, five of those years were with a co-teaching partner or special education aide. Christi was a fourth grade special education teacher. She co-taught a mathematics class with Cindy. She had taught for eight years. Cindy and Christi taught math to three special education students and eighteen general education students in a co-teaching setting.

The fifth grade reading co-teachers were Sue and Michelle. Sue was a fifth grade general education reading teacher. At the time of this study, she had taught 13 years with some co-teaching experience and had worked with special education inclusion aides in the past. Sue co-taught with Michelle for one reading class. Michelle was a fifth grade special education teacher with five years' experience in special education and one year experience co-teaching. Sue and Michelle taught reading to six special education students and sixteen general education students in a co-teach setting.

The qualitative descriptive case study included the results of data collected from the 47 question rating scale, 23 question semi-structured interview, two open-ended question post interview, and classroom observations during the spring semester. The teacher rating scale was adapted from a previous study from Shankland (2011) with permission and was emailed with a letter requesting the participation in the study. The rating scale questions consisted of nine categories related to roles of co-teachers, planning, instruction and administrative supports. The Likert-type scale rated answers based on the following response choices: 1-rarely (one time or less per semester), 2-seldom (once per month), 3-sometimes (once every

two weeks), 4-fairly often (one time per week), and 5-frequently (two or more times per week). The software NVivo, a qualitative analysis tool, was used to code and analyze the data. After reviewing each part of the rating scale as it related to the research questions, category names were added to NVivo. As the categories were reviewed, themes emerged that were determined to be related to the interview and classroom observation.

The interviews were 20 to 40 minutes in duration and consisted of 23 questions. The interview was adapted from a previous study from Shankland (2011) with permission. The questions focused on general questions of prior experiences in co-teaching regarding planning, instruction, assessment and administrative support. The post-interview, after the classroom observation, consisted of two open ended questions to allow for clarification of questions that arose during observation or data analysis. The interviews were transcribed and coded utilizing the software, NVivo, to develop ideas related to the research questions by the use of coding of relationships with categories and concepts (Walker & Myrick, 2006). Names of themes and patterns were identified as the data were separated into manageable parts using an audit trail (Hopefl, 1997). Axial coding was used to ensure accuracy as it related to the themes and to explore the relationship between the categories (Hopefl, 1997).

The classroom observations documented teacher instructional roles and identified the co-teach models utilized during instruction. The observer documented instructional tools such as strategies and accommodations/modifications provided to students and co-teacher interaction. Classroom observations were analyzed to determine the collaboration in the classroom using the themes from the rating scale and the interviews using NVivo software. Observation notes were reviewed to identify themes that emerged related to the rating scales and interviews to triangulate the data.

### **Trustworthiness and Transferability**

Trustworthiness was addressed based on credibility, transferability, dependability and confirmability (Shenton, 2004). Credibility was determined by using data collection and data analysis methods established as successful in research (Berg, 2001; Shenton, 2004). Triangulation of three data collection methods including an interview, a rating scale, and a classroom observation was used to ensure multiple data collection methods were implemented and to relate the different forms of data findings. Honesty in informants was established by allowing informants to refuse participation in the project, establishing rapport with interviewees, encouraging participants to be forthcoming with their responses (Shenton, 2004).

Transferability was addressed by identifying the school setting and description of the teachers who contributed data. The data collection methods included number and length of the interviews, rating scale and observation during the spring school semester (Shenton, 2004). Dependability was established by the previous researcher who developed and piloted the rating scale, interview, and classroom observation rubric Shankland (2011). The survey, *Supporting Access to the General Education Curriculum Survey* was developed by reviewing published surveys, checklists, and questionnaires (Shankland, 2011). The semi-structured interviews were developed and piloted by Shankland (2011) to include three sections, information about the classroom, planning, instruction, and administrative supports. The classroom observation rubric was developed and piloted to document teacher and student participation in a co-taught classroom (Shankland, 2011). Confirmability was ensured by the steps taken to report the exact teachers' responses (Shenton, 2004). An audit trail was created to ensure the steps used and decisions made in this research were traced. Information from

recommendations were provided by creating a flow throughout the data coded to create themes that led to recommendations (Shenton, 2004).

## Results and Interpretation

The following interpretation describes how the data collected from the rating scales, interviews and observations addressed the research questions.

Research question one asked, "How do co-teachers implement research-based co-teach models and strategies?" Research-based practices for co-teaching and the components required to implement the models including co-planning, co-instructing and co-assessing were discussed in the co-teaching topic previously. Themes identified in the data analysis related to the research-based practices were co-teaching models utilized by teachers, teacher collaboration and teacher co-planning.

Important to note is the report of teachers in the rating scale and interview regarding their lack of knowledge of co-teaching models and best practices in implementing the models for the appropriate lesson. Teachers reported in the rating scales sometimes using co-teach models to present the lessons and they often collaborated to modify lesson plans to increase accessibility for students with disabilities. However, the teacher indicate they rarely planned or implemented the appropriate co-teach model as described in research required for effective results. All co-teachers reported implementing small group or individual instruction that had been previously planned or determined during class as needed for student re-teach or remediation.

Even though neither set of co-teachers identified the co-teach model for instruction, it was noted during the classroom observations that Cindy and Christi implemented the parallel co-teaching model by both participating in the lecture illustrating the content taught by both teachers to the whole group. In Sue and Michelle's classroom observation, the general education teacher (Sue) led instruction while the special education teacher (Michelle) supported individual students as needed indicating a one-teach, one assist strategy was implemented.

Murawski and Lochner (2010) reported best practice for collaboration includes co-planning, co-instructing, and co-assessing. The teachers indicated that communication and collaboration within the co-teaching partnership was critical. The teachers reported planning together, however, they reported rarely collaborating to specifically determine co-instruction and assessment methods to be implemented. Cindy and Christi demonstrated in the observation and reported in the interview their support of each other and their collaboration effort as a team in planning and instructing. During the classroom observation, Sue delivered instruction and Michelle worked with students as needed with no evidence of a collaborative effort or plan for the lesson. During the interviews, Sue and Michelle both described they often planned independently and rarely implemented an identified co-teach model.

According to the rating scale, both sets of co-teachers modified their lesson plans to meet the needs of their students. Co-planning was observed with Cindy and Christi as they discussed the lesson prior to teaching it the day of the observation and indicated in the interview they often discussed how to present the lesson just prior to class. Co-teaching models were never discussed during planning according to the co-teachers interviewed indicating no plans were made prior to instruction regarding the use of a specific co-teaching

strategy. All teachers frequently administered common assessments to all students. The teachers stated that the special education teacher provided accommodations and modifications as required for test administrations for the special education students as required by the IEP. The rating scale indicated all teachers frequently modify tests for those students who are on a modified curriculum determined by the student's IEP.

Research question two asked, "How are teacher roles reflected in the co-teaching partnership?" Teacher roles were analyzed for implementation of research-based practices in a co-teaching partnership. Themes found when analyzing the roles of co-teachers in this study were the teachers exhibited a positive co-teaching relationship and learned from each other in co-planning and co-instruction and exhibited the traditional general and special education teacher.

The co-teachers' willingness to share the classroom and instructional responsibilities is key to a positive relationship. Christi and Cindy provided co-instruction to the class during the observation and both stated in the interview that their positive relationship benefits both the teachers and the students making it more enjoyable and interesting for all involved. Michelle and Sue emphasized that having two teachers in the classroom who co-plan and co-instruct is beneficial. However, their roles during the observation reflected the general education teacher, Sue, acted as the lead teacher while Michelle, the special education teacher, worked only with the special education students. All four teachers reported positive professional relationships between each co-teacher and having the opportunity to learn from each other. Specifically, the general education teachers both reported learning differentiated instructional strategies to teach their content area. The special education teachers reported learning the grade level content from lesson planning with the general education teachers.

The co-teachers reported during the interview that the general education teacher makes the instructional decisions for the classrooms due to experience with the grade level curriculum. This is reflected in research that general education teachers are regarded as the content specialist Mastropieri et al. (2005). In addition to taking the lead on the curriculum taught, the general education teachers reported in the rating scale and interview their roles were lead teacher and main instructional facilitator in the co-taught classroom. Both of the special education teachers indicated their major role was to assist the special education students and both would like to participate more in the co-instruction of lessons prior to re-teach or remediation. Specifically, the special education teachers reported the general education teachers' role was to make sure all students were successful and take the lead role in instruction and curriculum taught. The teachers were unanimous in reporting the special education teacher should modify assignments and tests and provide students with accommodations. In Cindy and Christi's classroom, Christi, the special education teacher, administered student accommodations. This was evident in both of the observations as it was solely the special education teachers' responsibility to provide accommodations to the students in the class. These results parallel research findings indicating the perception was that only special education teachers can provide the specialized knowledge regarding the provision of accommodations and modifications for struggling students (Friend and Cook, 2010; Mastropieri et al., 2005). The teachers emphasized that co-teachers in the classroom are beneficial to meeting the diverse needs of students during instruction. All teachers reported the general education teacher is the lead teacher due to their grade level content knowledge and the special education teacher is perceived as the support teacher. All reported the general education teacher should make instructional decisions and plan lessons with special education teacher input.

Research question three asked, "How does administrative support of co-teaching implementation impact co-teachers?" Administrative support is required for successful co-teaching classrooms. Themes identified in this area using the three data sources include administrators providing co-teaching training and scheduling for co-teacher collaboration. The teachers reported the campus administrator scheduled adequate planning time for co-teachers to collaborate to develop lesson plans in addition to ensuring the general and special education teacher schedules corresponded for the co-taught content areas. All teachers reported the campus administrator scheduled one day every nine weeks and one-half day every two weeks to collaborate and review lesson plans, however, they received no guidance assisting them with planning and execution of co-teach models. The rating scale and interviews indicated the co-teachers in this study possessed only a general knowledge of co-teaching strategies as a result of a lack of training. None of the teachers in this study had participated in training on co-teaching together, one special education teacher reported attending a co-teach training and the other three teachers had not attended co-teaching training. Consequently, even though the teachers reported positive administrator support, they had concerns regarding the need for initial and ongoing training in co-teaching strategies. They also reported a desire to be assigned to work with together as co-teachers for more than one year in order to develop a professional relationship and to improve co-teaching instruction in the classroom.

## Discussion

The teachers reported their belief in the benefits of co-teaching for students and teachers and they indicated the main reason for co-teaching is to provide special education students' instruction in the general education classroom. The results of the study found that all teachers had some experience in co-teaching classrooms previously, however, their knowledge of implementing co-teaching models and strategies appeared to be minimal as was also evident in a meta-analysis of qualitative co-teaching research that teachers consistently reported the need for in-depth and ongoing training in order to implement co-teaching strategies successfully Scruggs et al. (2007). In all cases, the teachers were forthcoming in providing information regarding their co-teaching experiences and implied their co-taught classrooms functioned appropriately to provide a positive student learning experience.

From the teachers viewpoints, benefits for students included teacher availability to special education students (Friend et al., 2010), two certified teachers with different perspectives on teaching (Kohler-Evans, 2006; Mastropieri et al., 2005), and social skills development (Murawski & Lochner, 2010). The benefits to teachers included providing a variety of instructional approaches (Friend & Bursuck, 2009; Kim et al., 2006; Thousand et al., 2006), teachers sharing ideas (Friend et al., 2010), and providing specialized knowledge in their areas of expertise (Friend et al., 2010; Mastropieri et al., 2005). The fifth grade co-teachers functioned separately in the classroom, providing instruction to their assigned students with no evidence of collaboration to provide co-instruction. The approach of the fourth grade co-teachers was a collaborative team effort and the approach of the fifth grade co-teachers was an individual effort based on their teaching assignment. Even though all teachers reported the benefits of co-planning to implement co-teaching, only the fourth grade co-teachers exhibited evidence of collaboration and prior co-planning during instruction with each teacher providing instruction and adapting to student needs.

The teachers viewed their roles in the co-taught classrooms from a more traditional perspective reporting the special education teachers' role as the specialist in adapting or

modifying assignments and the general education teachers' role as the specialist in the content curriculum. There was agreement between co-teachers regarding their roles in the classroom even though they did not report formally discussing teacher roles prior to instruction. Both pairs of co-teachers reported a mutual understanding that the general education teacher provided the content knowledge and lead teacher role and the special education teacher provided support to the general education teacher and instructional interventions required for the special education students. The data suggested that while the teachers were generally comfortable in their roles, they realized the need for more in-depth information regarding co-teach models and implementation strategies that could improve instruction in their co-taught classrooms. Again, these findings suggest the lack of knowledge in co-teaching models and strategies, inhibited the ability to streamline co-planning, co-instructing and co-assessing (Murawski & Lochner, 2010; Ploessl et al., 2010).

Appropriate administrative support for co-teachers includes allowing teachers adequate planning time, listening to teacher needs, providing extensive and ongoing training to co-teaching teams in the areas of co-teach models and strategies of implementation that include co-planning, co-instructing and co-assessing (Daane, Beirne-Smith, & Latham, 2000; Friend et al., 2010; Scruggs et al., 2007). The teacher's in this study reported administrators scheduled adequate planning time to prepare for co-teaching, however, the teachers did not receive training in best practices of co-planning, co-instructing and co-assessing, so the time was not utilized effectively. All the participating teachers required additional co-teaching training for effective implementation.

### **Practical Implications**

The co-teachers in this study reported the benefits of co-teaching for both special and general education teachers and students indicating a general understanding of the co-teach concept. Based on teacher reports, the concerns were identified as lacking the knowledge to implement research-based co-teaching models and strategies. The study implies that while teachers acknowledge the benefits, they realize the need for obtaining expertise in co-teaching models and strategies for optimal benefit. Positive administrative support for co-teachers is identified as key to implementation. The study has implications for developing collaborative co-teaching teams highlighting the benefits of administrative support and the need for professional training.

### **Limitations**

The study was limited by sample size and geographic location. The study included only four elementary teachers, two general and two special education teachers, implementing co-teaching strategies in two grade levels. The location of this study represented teacher perspectives in one elementary school in a southern state. Due to the small size, the findings may not represent the majority elementary schools across the country making it difficult to generalize the findings.

Further research specifically in the areas of teacher knowledge of co-teaching, appropriate teacher co-teaching training, and co-teacher collaboration is needed. (Kloo & Zigmond, 2008; Tremblay, 2013). Qualitative study in elementary schools from a broader geographic area will assist in gathering information to identify effective co-teach implementation strategies. This study and prior studies identified the need for research into training teachers to implement the co-teach models and strategies effectively to establish a standard protocol for implementation.

## Conclusions

Based on the information gleaned in this study, two conclusions can be considered to support recommendations for implementing an effective co-teach model in classrooms. First, the data analysis of teacher responses indicated that while teachers report an awareness of the research-based models for co-teaching, they lack expertise in implementing the models. All the teachers reported the need for further training to understand the models and strategies to implement them effectively. This is reflective of research indicating that teachers are unprepared for their roles as co-teachers due to a lack of co-teaching training (Friend et al., 2010). The success of a co-teaching partnership is based on the co-teachers' understanding and expertise in implementing research-based co-teaching models. These findings support the need for campus administrators to provide co-teachers with intensive and ongoing training in research-based co-teach models and strategies to implement them successfully.

Secondly, the data indicated the teachers in this study did not consistently function as a collaborative partnership to co-plan, co-instruct and co-assess in the co-taught classroom. The teachers indicated they had inadequate knowledge of co-teaching strategies and were generally found to be unprepared for the co-teaching roles. All of the teachers reported the need for training in strategies to effectively work as a collaborative partnership. Based on the evidence from the data, even though all of the teachers were striving to work in an amiable manner, each of the co-teachers functioned somewhat independently in planning, instruction and assessing. In addition, the teachers reported the continued traditional belief that the general education teacher holds the majority of the responsibility for classroom instruction while the special education teacher functions in a support role indicating a lack of a true cohesive partnership as defined by the co-teach research for effective implementation (Friend et al., 2010).

As a result of the findings in this study that correlated with practices identified in research, the recommendation for campus administrators is to consider in addition to providing ongoing co-teacher training and support in the co-teach models and strategies for implementation, they also need to provide co-teachers the opportunity to train together. Co-training has been found to play an important role in developing a collaborative co-teach partnership to learn effective methods of co-planning, co-instruction and co-assessment (Friend et al., 2010). It is imperative for the administration to recognize the need for initial and ongoing training as the co-teachers reported they did not fully understand the co-teaching models and methods to implement.

## References:

Annual Disability Statistics Compendium Report (2013). Retrieved from:<http://disabilitycompendium.org/statistics/special-education/9-4-special-education-educational-environment-students-ages-6-to-21-served-under-individuals-with-disabilities-education-act-part-b-that-spent-40-percent-or-more-time-inside-regular-class-fall-2013>.

Berg, B. L. (2001). *Qualitative research methods for the social sciences*. Needham Heights, MA:Allyn & Bacon.

Cramer, E., Liston, A., Nevin, A., & Thousand, J. (2010). Co-teaching in urban secondary school districts to meet the needs of all teachers and learners: Implications for teacher education reform. *International Journal of Whole Schooling*, 6(2), 59-76.

Daane, C. J., Beirne-Smith, M., & Latham, D. (2000). Administrators' and teachers' grades.

*Education*, 121(2), 331-339.

DiCicco-Bloom, B. & Crabtree, B. F. (2006). The qualitative research interview. *Medical Education*, 40 (14), 314-321.

Friend, M. (2008). Co-teaching: A simple solution that isn't simple after all. *Journal of Curriculum and Instruction*, 2(2), 9-19.

Friend, M. & Bursuck, W. D. (2009). *Including Students with Special Needs: A Practical Guide for Classroom Teachers* (5<sup>th</sup> Ed.). Columbus, OH: Merrill.

Friend, M., Cook, L., Hurley-Chamberlain, D., & Shamberger, C. (2010). Co-teaching: An illustration of the complexity of collaboration in special education. *Journal of Educational and Psychological Consultation*, 20(1), 9-27.

Hoepfl, M. C. (1997). Choosing qualitative research: A primer for technology education researchers. *Journal of Technology Education*, 9(1), 47-63.

Individual with Disabilities Education Improvement Act of 2004, 20 U. S. C. §1401 *et seq.* (2004).

Jensen, H. (2010). The logic of qualitative survey research and its position in the field of social research methods. *Forum: Qualitative Social Research*, 11 (2), Art. 11.

Kelley, K., Clark, B., Brown, V., & Sitzia, J. (2003). Good practice in the conduct and reporting of survey research. *International Journal for Quality in Health Care*, 15 (3), 261-266.

Kim, A. H., Woodruff, A. L., Klein, C., & Vaughn, S. (2006). Facilitating co-teaching for literacy in general education classrooms through technology: Focus on students with learning disabilities. *Reading & Writing Quarterly*, 22(3), 269-291.

Kloo & Zigmond, 2008)

Kohler-Evans, P. A. (2006). Co-teaching: How to make this marriage work in front of the kids. *Education*, 127, 260–264.

Mastropieri, M. A., Scruggs, T. E., Graetz, J., Norland, J., Gardizi, W., & McDuffie, K. (2005). Case Studies in Co-Teaching in the Content Areas Successes, Failures, and Challenges. *Intervention in School and Clinic*, 40(5), 260-270.

McLeskey, J., Landers, E., Hoppey, D., & Williamson, P. (2011). Learning disabilities and the LRE mandate. An examination of national and state trends. *Learning Disabilities Research and Practice*, 26(2), 60-66.

Murawski, W. W. & Lochner, W. W. (2010). Observing co-teaching: What to ask for, look for, and listen for. *Intervention in School and Clinic*, 1-10.

Ploessl, D. M., Rock, M. L., Schoenfeld, N. A., & Blanks, B. (2010). On the same page: Practical techniques to enhance co-teaching interactions. *Intervention in School and Clinic*, 45 (3), 158-168.

Rea, P. J. & Connell, J. (2005). Minding the five points of co-teaching. *The Education Digest*, 29-35.

Scruggs, T. E., Mastropieri, M. A., & McDuffie, K. A. (2007). Co-teaching in inclusive classrooms: A metasynthesis of qualitative research. *Exceptional Children*, 73(4), 392-416.

Shankland, R.K. (2011). *Bright Spots and missed opportunities: What co-teachers in one Midwestern high school do to support access to the general education curriculum* (Doctoral dissertation). Retrieved from UMI Dissertation Publishing. (3488262)

Shenton, A. K. (2004). Strategies for ensuring trustworthiness in qualitative research projects. *Education for Information*, 22, 63-75.

Snyder, T.D., de Brey, C., & Dillow, S.A. (2015). Digest of Education Statistics, 2015, National Center for Education Statistics. 2016014. Retrieved from: <https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2016014>.

Thousand, J. S, Villa, R. A., & Nevin, A. I. (2006). The many faces of collaborative planning and reaching. *Theory Into Practice*, 45 (3), 239-248.

## **Single-Case Experimental Research: A Methodology for Establishing Evidence-Based Practice in Special Education**

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### **Abstract**

*In the field of special education there is a dearth of group experimental studies that establish evidence-based practice. The effort to establish evidence-based practice has been associated with emphasizing experiments by using randomized controlled trial with large numbers of participants who are randomly assigned to a treatment. However, single-case design (SCD) research can play a vital role in filling the gaps and determining educational interventions that establish evidence-based practices in the special education. The goal of this present paper is to provide an overview of SCD methods and how these methods can establish evidence-based practices in special education. The author shares the critical features of SCD, including the way steady state strategy and baseline logic works in common designs. Internal and external validity are also addressed. Finally, this paper communicates why a visual analysis of data is considered conservative in SCD rather than tests of statistical significance.*

**Keywords:** *Special Education; Single-Case Design; Evidence-Based Practice*

### **Introduction**

Applying high quality research is essential to establish an evidence-based practice in special education. Most evidence-based practices in special education emphasize establishing an intervention, instructional strategy, or teaching program based on a scientific approach

(Mesibov & Shea, 2011). Organizations in general education and special education such as the What Works Clearinghouse, Council for Exceptional Children, and Division 16 of the American Psychological Association have created guidelines to determine quality and quantity of research that leads to evidence-based practice (Plavnick & Ferreri, 2013). The reason behind this educational policy is that practices with prior evidence of effectiveness under research conditions are more likely to produce positive educational outcomes (Odom et al. 2005).

The scientific community reviews randomized controlled trials as the "*gold standard*" to establish evidence-based practice in intervention research (Kazdin, 2011; Plavnick & Ferreri, 2013). In special education, it is quite difficult to apply randomized controlled trials because students' characteristics vary across multiple factors. Cannon, Guardino, Antia, and Luckner (2016) assert that deaf and hard of hearing students vary across multiple factors such as, a) hearing level, b) age at identification, c) age at amplification, d) language exposure, e) early intervention, f) additional eligibility for specialized services, and g) parental hearing status. SCD could benefit special education researchers in establishing evidence-based practice. The goal of this paper is to provide an explanation of the ways in which SCD can be used to document evidence-based practices in special education. First, it presents an overview of the critical features of SCD, how internal and external validity are addressed in SCD, along with an explanation regarding the way in which a steady-state strategy and baseline logic work in common design such as reversal and multiple baseline experimental designs. Second, the paper describes the way to determine a functional relationship (to document causal) in such designs. It also discusses why visual analysis of data rather than tests of statistical significance is considered a conservative approach in SCD.

Even though a number of textbooks discuss single-case design deeply and thoroughly, these textbooks discuss single-case design in a broader context. Adding to this, many textbooks do not address applying single-case design in special education field. That is, they do not use relevant examples in how these designs can be used in special education settings. Examples that illustrate single-case design in this paper were selected from published literature in special education.

## Features of SCD Methodology

SCDs are true experiments, and thus they can determine the causal relationship between independent and dependent variables (Horner et al., 2005; Kazdin, 2011). The distinctive characteristic of SCDs is their ability to evaluate interventions with just one or a few participants. Results from group data definitely are essential; however, researchers seek to understand, with greater specificity, the effectiveness of interventions on participants as individuals, which group studies typically do not address. Therefore, SCDs can be used to improve an intervention in case it does not work or fails to achieve the goal (Kazdin, 2011). SCD has several critical features that make it distinctive from other designs. Some key features are: 1) the individual participant as the unit of analysis, 2) the operational definition of study characteristics, 3) the use of baseline/intervention conditions, 4) experimental control, 5) the repeated measurement of target behaviors, 6) the repeated and systematic introduction of interventions, and 7) visual analysis (Cakiroglu, 2012; Horner et al., 2005). These features contribute to establishing evidence-based practices in special education. Each feature is described in the following sections. The use of baseline/intervention conditions, and experimental control were discussed deeply in steady state strategy and baseline logic section.

### 1.) *The individual participant as the unit of analysis*

SCD can only use one participant; however, more than one participant (e.g., 3 to 8) is

desirable in SCD study. Each individual serves as his/her own control. Performance prior to intervention is compared to performance during and/or after intervention (Horner et al., 2005). Therefore, researchers use individual data analysis to show the effectiveness of an intervention.

## **2.) Operational definition of study characteristics**

Defining aspects such as the target behavior(s), participant demographics, and research setting, are pivotal in SCD studies because these explicit definitions allow other researchers to more accurately replicate an experiment (Cakiroglu, 2012; Kratochwill et al., 2010). For example, in deaf education, specific characteristics that should be defined and documented in detail, include: a) degree of hearing loss, b) age at onset of hearing loss, c) gender, d) ethnicity, e) presence of additional identified disabilities, f) mode of communication (speech, sign, etc.), g) , and h) hearing and socioeconomic status (SES) of parents/caregivers (Paul, Wang, & Williams, 2013). If the researcher does not clearly and objectively define the target behavior or skill, replication is less likely (Cooper, Heron, & Heward, 2007). The definition of dependent variables should be objective, observable and measurable in order to help reduce any likely disagreement between observers collecting data (Sealander, 2004). Without directly well-written definitions, researchers cannot be able to clearly and truthfully measure the target behavior. Table 1 illustrates some operational definitions for dependent variables.

**Table 1. Examples of operational definitions for dependent variables**

Behavior	Definition
Word Recognition (Dolch words and bridge phrases).	"The teacher signed each word or phrase to the student and asked him or her to label the word or phrase by fingerspelling the word, voicing the word, or pointing to the word that corresponded to the sign produced by the researcher" (Dimling, 2010, p 430).
Reading Comprehension	"The operational definition for reading comprehension [is] the number of details students retold in one-minute, following oral reading of instructional-level, content-area text" (Benedict, Rivera & Antia, 2015 p. 3).

In addition to this, investigations must indicate for whom the practice is effective and in what context" (Odom et al. 2005).

## **3.) Repeated and systematic measurement of target behaviors**

Repeated measurement of target behaviors illustrates the performance of a participant in both the baseline and the intervention conditions (Kazdin, 2011). The baseline is the first phase in SCD and is used to establish initial patterns of behavior. The baseline will be utilized later in order to compare the performance of a participant after an intervention is introduced (Kennedy, 2005). The intervention phase is implemented after the baseline phase when the baseline has been established as relatively stable. Systematic repeated measurements reveal that the data was continuously recorded on a target behavior, thus providing a true representation of the participant's performance during each session. In group design, the only way to observe participant's performance is by using pretests and post-tests and comparing the results to control group. Whereas in single-case design, a participant's performance can be observed during each session, which means controlling to any threats to internal (Neuman & McCormick, 1995; Tankersley, Harjusola-Webb & Landrum, 2008). In addition, the use of repetition illustrates the causal relationship between the dependent and the independent variable. (how this occurred discussed below)

#### **4.) Visual Analysis**

Visual analysis is the main approach to analyzing data in single-case design (Kahng et al., 2010). The visual analysis shows the basis for comparing pre-intervention and intervention phases from baseline phase to intervention phase (Kratochwill & Levin, 2010). Six critical elements are used to assess progress within- and between-phase data patterns: a) level (mean), b) trend (slope), c) variability (standard deviation), d) immediacy of the effect, e) overlap, and f) consistency of data patterns across similar phases (Kratochwill et al., 2010). Visual analysis of these elements is used to determine whether a causal relationship exists between an independent variable and a dependent variable.

#### **Internal and External Validity**

Researchers implementing intervention studies are concerned with internal and external validity (Cannon, Guardino, Antia, & Luckner, 2016). *Internal validity* means that the intervention changes the dependent variable and extraneous factors are not influenced by the outcome of the intervention. When the results are attributed with little or no vagueness to the impact of the intervention, the experiment is deemed to be internally valid (Kazdin, 2011). Threats to internal validity can be enhanced through replication (Kratochwill et al., 2010). *External validity* refers to the extent the results of the intervention can be generalized to other people and contexts beyond those who participated in the study (Horner et al., 2005). External validity can be improved through replication.

Undoubtedly, one or few participants is not representative of all individuals coming from the same population. In this case, researchers can maintain external validity by replicating the intervention. Generalization can be confirmed by direct and systematic replications. In direct replication, the researcher repeats the same study (study characteristics) with participants who have similar characteristics, whereas systematic replication is repeating the study with participants who have different characteristics than those who participated in the original study. In the field of special education, the researcher can conduct a study in an elementary school and then replicate it with students in high school (Cakiroglu, 2012). Major threats to internal validity can be controlled over steady state strategy and baseline logic.

#### **Steady State Strategy and Baseline Logic**

Steady state strategy is defined as “an approach to making experimental comparisons that involves measuring responding for each participant repeatedly under each condition in an effort to assess and manage extraneous influences and thereby obtain a stable pattern of responding that represents the full effects of each condition” (Johnston & Pennypacker, 2009, p. 195). Steady state strategy shows the basis for baseline logic as can be seen in Figure 2.

#### **Baseline Logic**

Baseline logic encompasses three factors: prediction, verification, and replication Cooper et al., 2007). However, some scholars such as Riley-Tillman and Burns (2009) add *affirmation of the consequent* as a separate phase. Affirmation of the consequent is classified as a form of replication in traditional experiments (Alberto & Troutman, 2013). These guide the baseline logic and present them visually that can be seen in figure 5.

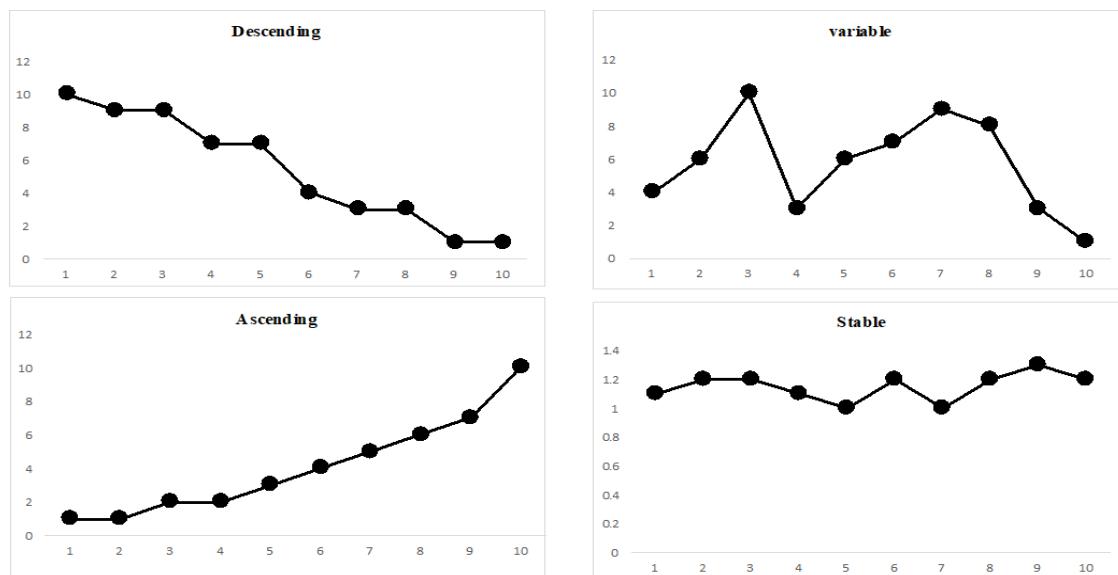
#### **Baseline Data**

The first phase in SCD encompasses gathering and recording of baseline data of the level of the dependent variable in the natural environment before applying the intervention for several days (Alberto & Troutman, 2013). Therefore, the baseline data or phase serves

two critical functions. First, baseline data serves as a *descriptive function* whereas the data depicts the existing level of performance. Second, baseline data serves as a *predictive function* whereas the data serves as a predication of the level of performance before an intervention is implemented (Kazdin, 2011).

### Predication.

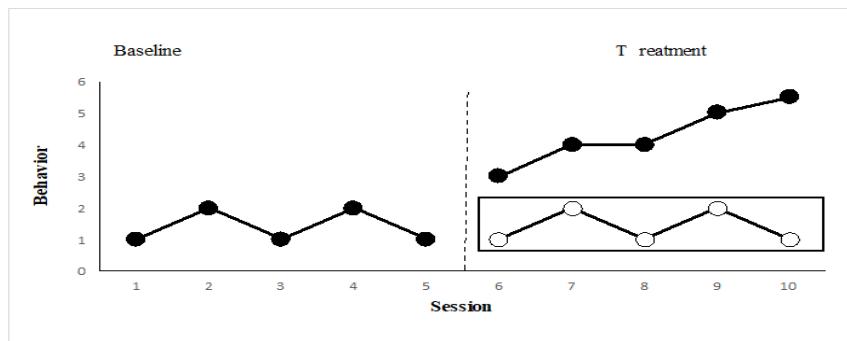
The baseline phase needs to be continuous for many sessions prior to the implementation of the intervention in order to judge the effectiveness of the intervention. Also, it is critical that the data be stable. The stability can be assessed by two factors: variability and trends. Simply put, variability of data means oscillating student's performance through the baseline phase when the variability in data becomes highly oscillatory, which makes it more difficult to draw conclusions regarding the effects of the intervention. In this case, when the baseline is unstable, a researcher needs to look at the definition of a target behavior because the operational definition of target behavior may not adequately and accurately be described, table 1 showed a perfect example of a good operational definition of target behavior. Trend in data points involves three successive data in the same direction, which means the baseline may present no trend, increase trend, or decrease trend, as seen in Figure 1. An ascending baseline indicates an increasing trend; therefore, in this case the researcher can apply the intervention that aims to decrease the behavior, and vice versa with a descending baseline (Alberto & Troutman, 2013).



**Figure 1. An example of descending, ascending, variability, and stability of data.**

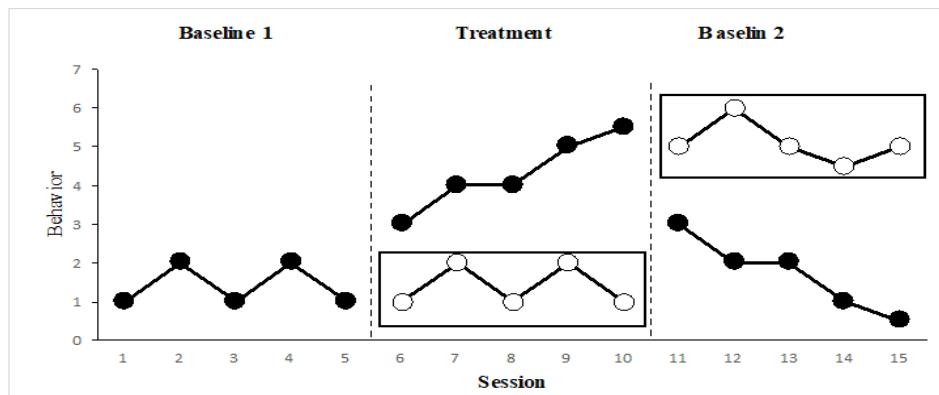
### Affirmation of Consequent.

Essentially, the independent variable has to be implemented when the baseline is stable in order to see whether the intervention results in a change in the behavior or not. This is referred to as *affirmation of the consequent*. Figure 2 shows a successful *affirmation of the consequent*. Steady state responding over the baseline allows the forecast if the treatment was not implemented (or not affective), then the data will still be the same as the data in the shaded area. Thus, the intervention was implemented and we can clearly see how the target behavior was changed repeatedly. This is detecting the correlation between the independent and dependent variables.



**Figure 2. Baseline logic: Affirmation of the consequent.  
Verification.**

The verification phase is conducted in order to confirm the initial hypothesis of the previous predication baseline. For example, removing the intervention so that the target behavior returns back to baseline level is an example of verification (Riley-Tillman & Burns, 2009). In other words, when the researcher wants to double check that the intervention was influential to the target behavior after the predication baseline was stable, then the researcher removes the intervention. If the intervention results in a decrease of target behavior, then the predication is verified. Figure 3 illustrates the procedure.



**Figure 3. Baseline logic: Verification.**

### Replication.

"*Replication is the essence of believability*" (Baer, Wolf, & Risley, 1968, p. 95).

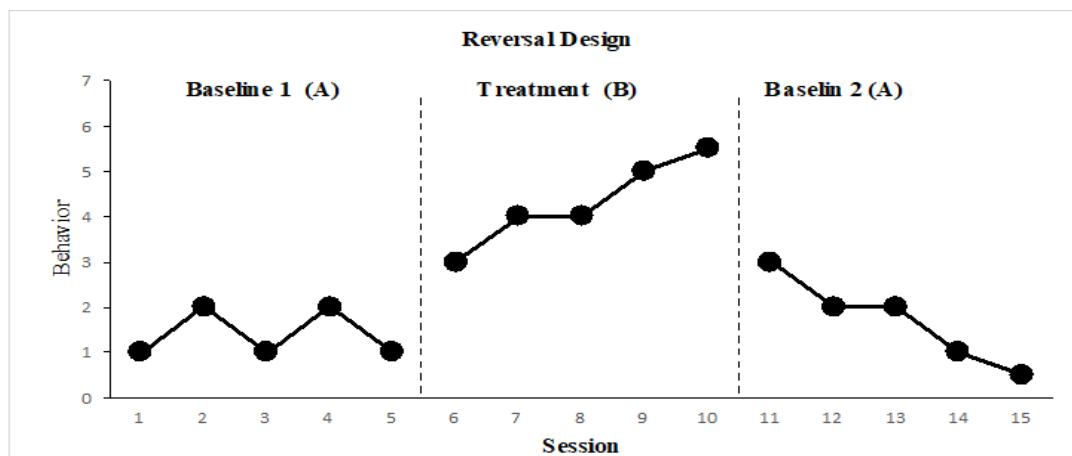
The goal of the replication phase is to confirm the initial intervention effects observed in the affirmation of the consequent phase (Riley-Tillman & Burns, 2009). After steady state responding is achieved over baseline 2, the intervention is reintroduced over intervention 2 phase in order to determine the reliability of a functional relationship between the independent and dependent variables. Also, it offers controlling of all extraneous factors that might effect treatment.

### Types of SCD

Reversal, alternating, multiple baseline, and changing criterion designs are all types of SCD. However, this paper highlights only two designs (reversal and multiple baseline designs) because they are most commonly used in special education published research. Hammond and Gast (2010) review eight special education journals between 1983 and 2007 to identify which methods are commonly used. 1,936 articles were reviewed, and the researchers concluded that reversal designs and multiple baseline designs were commonly used compared to other designs.

### **Reversal Design.**

Reversal or withdrawing design is widely used by special education researchers. Therefore, it entails repeated measures of behavior in three phases sequentially, at least: a) an initial baseline phase, that is, the independent variable (intervention or practice) is not presented, b) an intervention phase, that is, the intervention is presented, and c) a return to baseline condition, that is, the intervention or practice is removed in order to see to what extent the intervention is effective (Cooper et al., 2007). Consequently, reversal design refers to the withdrawal of an independent variable during one or more phases of a study in order to explain a practical relationship between the independent variable and the target behavior (Richards et al., 1999). As seen, in figure 4, baseline (A) denotes the data are collected until the steady state responding has been achieved. The following step is the treatment phase (B) wherein the intervention is applied. Then, return to (A) phase in which the intervention is removal in order to demonstrate the functional relationship between the intervention and the target skill (Cakiroglu, 2012). This is called **A-B-A design**, which is the basis of reversal design. In addition, there are other types of design, such as A-B-A-B; A-B-A-B-A-B; B-A-B and so on.



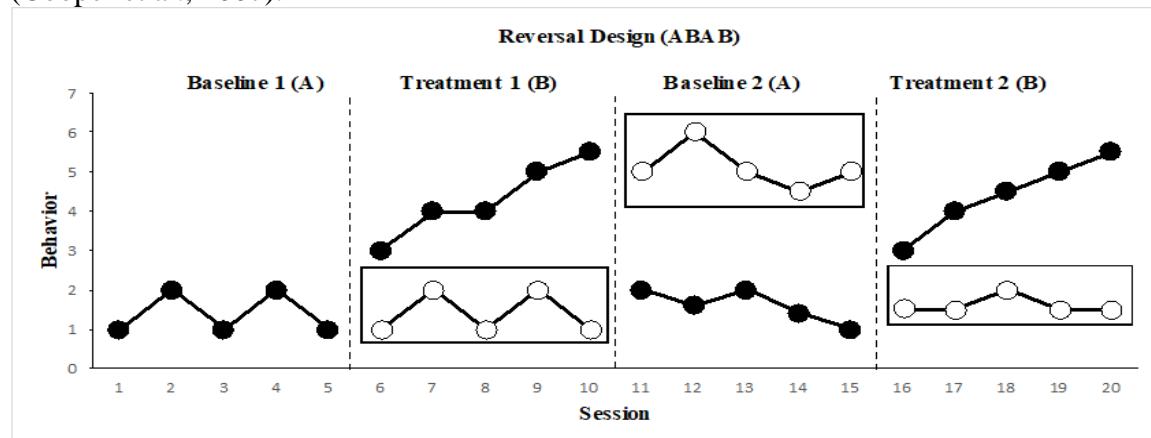
**Figure 4. A-B-A design.**

The ideal reversal design is an ABAB paradigm due to reintroducing B phase, which means there is a replication of the intervention effects to demonstrate the change in the target skill. This design is straightforward and powerful in demonstrating effective relationships between an independent and dependent variable (Cooper et al., 2007). The purpose, and thus, operation of ABAB design is that: the baseline (A) data are gathered on a target skill for few days. Then, the researcher initiates the treatment (B) for a certain time and gathers data on the same target skill. After that, the researcher returns to (A) phase in which she/he removes the treatment to identify whether or not the target skill comes back to the initial baseline data level. Eventually, the treatment is reintroduced to confirm the alteration in the target skill that was forecast (B), see figure 5 (Risley. 2005). This paradigm is appropriate in terms of increasing or decreasing a target skill that is flexible or malleable such as problem behavior. For example, Belfiore, Basile, and Lee (2008) implemented an intervention by using A-B-A-B reversal design with a 7-year-old, first grade Caucasian boy with Down syndrome, who was also diagnosed with attention deficit hyperactivity disorder (ADHD). The research aimed to determine the effect of the high-probability command sequence (HPCS) on student compliance to low probability requests. The student was frequently non-compliant to classroom requests by saying "no," or ignoring the requests. He was enrolled in a life skills

program located in a general education elementary school with other students with developmental disabilities. The dependent variable was percentage compliance to a low probability command (e.g., "Go to your desk," "Sit down."). Compliance to the HPCS (e.g., "Touch head," "Give me high five," "Clap your hands") was also observed to assure the command requests stayed at a high level of compliance throughout the study.

In first baseline phase (A), mean compliance to low probability commands was 13%, and ranged from 0–30% compliance. Through the first intervention phase (B), compliance immediately increased, and stayed high at a mean of 78%, and ranged from 70–90%. When the researchers removed the intervention, the data immediately decreased and stabilized at levels similar to the first baseline. Through the return to baseline (A), mean compliance to low probability commands returned to a low level of 17% compliance, ranging from 10% to 30% compliance. When the intervention phase was re-introduced (B), mean compliance increased to 85%, ranging from 80% to 90% compliance. Through the follow-up phase, 7 days after the intervention was completed, compliance to low-probability commands stayed high at 90% for both sessions.

The role of steady state strategy (predication, verification, and replication) was illustrated in figure 5. As illustrated here, after a stable pattern of responding is achieved through baseline 1, the treatment is introduced. Hypothetically, if the treatment is not introduced or simply not effective, it will still be the same, as suggested in the data in the rectangle shape in treatment 1; this shows predication part. Next, when steady state responding is obtained in Treatment 1, the intervention is removed, and the baseline reverts. When baseline 2 is the same or roughly the same as baseline 1, verification of predication is obtained. Also, when an intervention is reintroduced and given the same as treatment 1 or approximately the same, replication is achieved and we can assert that the intervention works (Cooper et al., 2007).

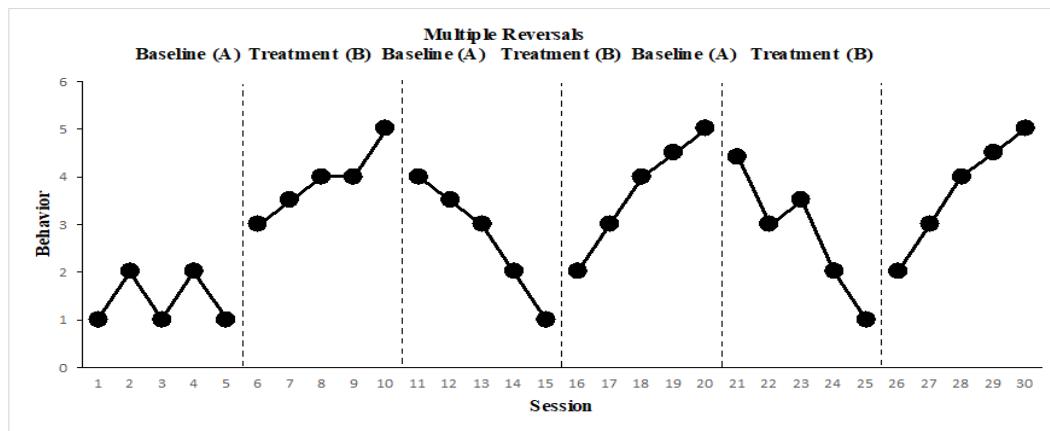


**Figure 5. A-B-A-B design.**

### Types of the A-B-A-B design

#### Repeated Reversals or Multiple Reversals.

Simply put, this model is an extension of A-B-A-B design, in which the independent variable is removed and reintroduced a second time like so A-B-A-B-A-B (see figure, 6). A researcher who uses multiple reversals shows convincing evidence of the functional relationship between an independent and dependent variable (Cooper et al., 2007).



**Figure 6. Multiple reversals.**

### B-A-B Design

B-A-B design reverses A-B-A design, that is, the independent variable is implemented in the first phase (B), then removed in phase (A), and then reinstated again. B-A-B design is a weak design due to not being able to assess the impact of treatment on the pre-intervention level of responding. The non-treatment in phase (A) cannot confirm a prediction of the previous nonexistent baseline. Therefore, B-A-B design presents no data to show "whether the measures of behavior taken during the A condition represent preintervention performance, sequence effects cannot be ruled out: The level of behavior observed during the A condition may have been influenced by the fact that the treatment condition preceded it" (Cooper et al., 2007, p. 180).

### Multiple Treatment Reversal Designs.

Multiple treatment reversal designs are used to compare the impact of two or more interventions on the baseline condition or to compare interventions with each other (e.g., A-B-A-C-A-C, A-B-A-C-B-C-B, A-B-C-B-C-B-C, and A-B-A-C-A-D-A-C-A-D) (Hammond & Gast, 2010). The letters *C*, *D*, and so on denote additional conditions (Cooper et al., 2007). Therefore, a researcher who uses reversal design to compare two or more treatments are more likely to encounter two extraneous variables by sequence effects that must be taken into account in order to control them as much as possible.

### Implication into Reversal Designs

There are some behaviors that cannot be implemented with reversal design such as learning to read. As children learn how to read or decode certain words, it is impossible for them to get back to the previous phase, that is, prior to the acquisition of skills. Consequently, a researcher cannot show a functional relationship between independent and dependent variables because the target skill is not revertible (Cakiroglu, 2012). However, reversal design can be used with problematic behaviors as was demonstrated in the Belfiore, Basile, and Lee (2008) study.

### Multiple Baseline Designs

The multiple baseline design is the most common used experimental design with regard to evaluating intervention effectiveness. It is a powerful strategy that allows researchers to examine the impact of an independent variable through multiple settings, behaviors, and participants without resorting to removing the intervention so that it verifies the development in behavior (Cooper et al., 2007). As discussed previously in reversal design, the nature of reversal design requires the removal of the treatment in order to verify

the prediction that was established in the baseline condition. However, the equation is different in the multiple baseline experimental design.

There are three basic types of multiple baseline designs:

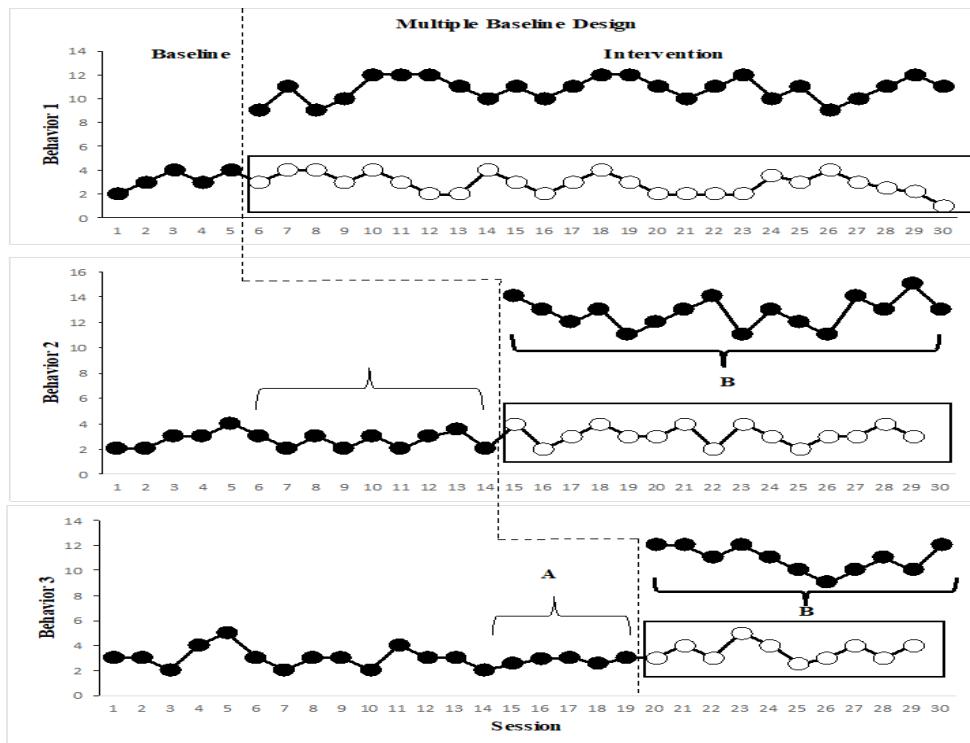
- Multiple baseline across behaviors, that is, it encompasses two or more different treatments of the same participant or participants.
- Multiple baseline across settings, that is, there is the same treatment with the same participant in different settings, situations, or time periods.
- Multiple baseline across subject, that is, it encompasses the same treatment with two or more participants (Cooper et al., 2007).

In a multiple baseline design, researchers combine a baseline condition with a treatment condition across participants, behaviors, or settings. A stable baseline is obtained for a participant, behavior, or setting, then the treatment is implemented for the first participant, behavior, or setting. The data are gathered for another participant, behavior, or setting. When the alteration occurs for the baseline that receives the treatment, the procedure is repeated with the second behavior, participant, or setting (Tankersley et al., 2008).

To understand the procedure more clearly, figure 7 presents an illustrative picture of multiple baseline designs. As can be seen, the data shows predicted measures if the baseline condition is not changed (rectangle area in behavior 1, 2, and 3). Baseline data points in both behavior 2 and 3 with bracket demonstrate the prediction of behavior 1. Whereas behavior 3 with bracket A demonstrates the prediction of behavior 2, data obtained through the intervention condition for both behavior 1 and 2 as can be seen in both B brackets, provide replications of the effectiveness of the intervention (Cooper et al., 2007).

For example, Dimling, (2010) applied a multiple baseline design to determine the effects of the vocabulary intervention on word recognition, production, and comprehension with six 2<sup>nd</sup> graders who were deaf. Hearing losses were all of a bilateral sensorineural nature and ranged from moderate to profound. Two of the 6 students had additional disabilities. Two types of vocabulary words were used for the vocabulary intervention: adapted Dolch words (commonly found in most basal readers ) and bridge phrases (e.g., fall down and clean up). This intervention last 6 weeks and all of the students were taught 12 words each week. The results indicated the baseline means for mastered Dolch word recognition, production, and comprehension ranged from 0.00 to 0.33 out of 3.00 words mastered. The baseline means for mastered bridge phrase recognition, production, and comprehension ranged from 0.00 to 0.20 out of 3.00 phrases. All six students had difficulty mastering both types of vocabulary (i.e., Dolch words and bridge phrases) across all three variables (i.e., recognition, production, and comprehension).

In the baseline phase, two students remained in baseline for 3 sessions, two students remained in baseline for 5 sessions, and two students remained in baseline for 7 sessions. The first group of students, who remained in baseline for only 3 sessions, received an intervention in session 4 while the other groups remained in baseline without an intervention in order to see if the intervention was actually effective with the first group or not. When the first group showed a significant increase in dependent variables, the second group received the intervention in order to replicate the effectiveness of the intervention that occurred with first group. The second group was immediately effected when the intervention was introduced, while the third group remained in baseline phase. Finally, the third group was introduced to the intervention after the second group showed improvement in all three variables. This kind of staggered implementation demonstrated how the intervention was effective, as the data revealed the same positive results with all three groups (six participants). The results of the intervention showed that students mastered 78%-100% of the Dolch words and 5%-97% of the bridge phrases over the course of the vocabulary intervention.

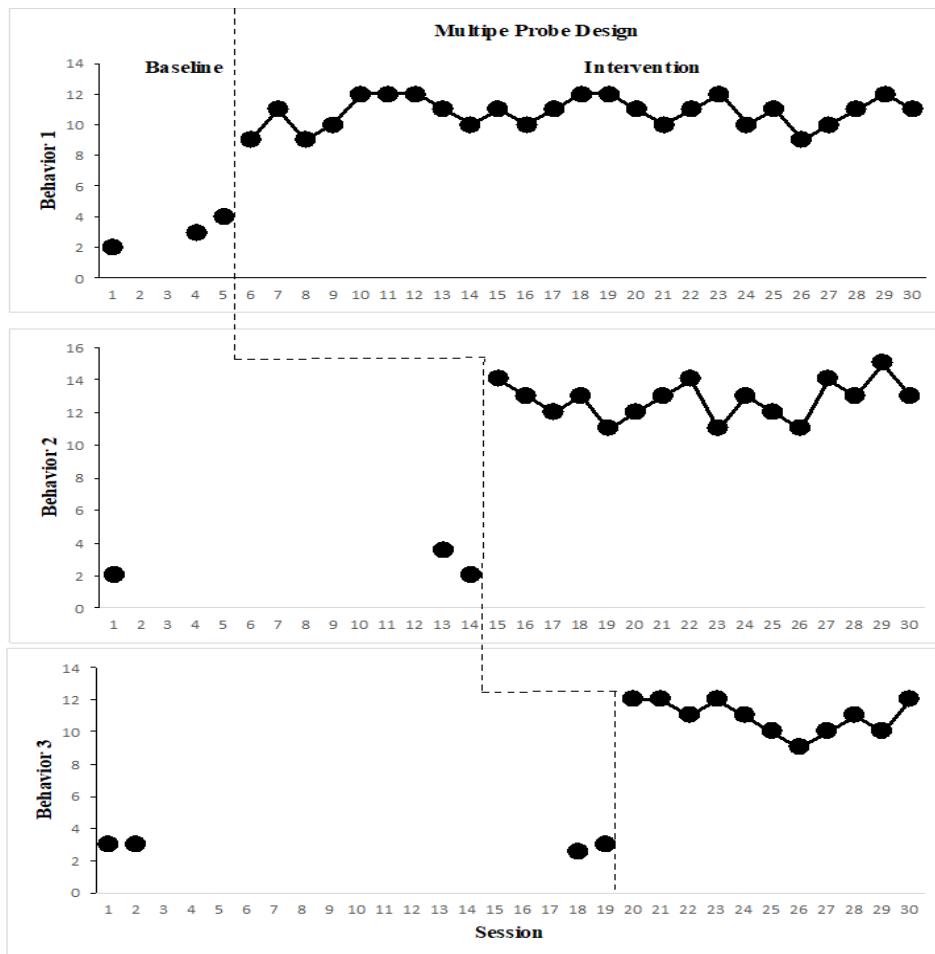


**Figure 7. Multiple baseline design.**

### Design Variation

#### Multiple Probe Designs.

In the multiple probe design, sporadic measures occur at the initial stage of the experiment and then after each time a subject has mastered one of the behaviors or sequential skills. True baselines are gathered for each behavior prior to instruction (intervention). The multiple probe design is beneficial for assessing the impact of instruction on skill sequences when it is not likely to happen that the subject will master later steps without instruction. In addition, multiple probe design is also beneficial for cases where a lengthy baseline could have negative affects for the subject or the intervention (Cooper et al., 2007). Figure 8 offers an example of how this design can be implemented.



**Figure 8. Multiple probe design.**

### Delayed Multiple Baseline Design.

In the delayed multiple baseline design, an initial baseline and intervention are initiated for one behavior, setting, or subject. Then, subsequent baselines for additional behaviors are introduced in a staggered or delayed fashion (Cooper et al., 2007).

Houston-Wilson, Dunn, van der Mars, & McCubbin, (1997) used a single-case delayed multiple baseline design across six student participants with developmental disabilities. The student participants' ages were 9 to 11 (5 boys and 1 girl). All students were classified as having mild mental retardation and were studying in a self-contained special education class. However, the students were regularly integrated into physical education, art, and music. Six typically developing peers served as peer tutors to the six student participants with mild mental retardation. The study aimed to investigate the effect of untrained and trained peer tutors on improving the motor performance of students with developmental disabilities in integrated physical education classes. The dependent variable in the study was the ability to perform critical elements of fundamental motor skills (the horizontal jump, catch, overhand throw, forehand strike, and sidearm strike).

The researcher trained the peer tutors on three particular teaching skills: to use appropriate cues, feedback, and task analysis of motor skills. The peer tutors were given handouts that defined these teaching skills. They were also given a script of scenarios that communicated what appropriate instruction looked like. The results of this study indicated that the student participants who worked with untrained peer tutors showed no significant improvement in their mean percentage of motor skill appropriateness score compared to trained peer tutors. This was observed across student participants 1, 2, and 3. Trained peer

tutors, however, assisted the student participants in improving their mean percentage of motor skill appropriateness score. This prediction was observed across participants 1 and 3. The results concluded that tutoring was efficient when the peer tutors were provided adequate training to ensure that their tutoring is focused on the target behaviors.

Generally, the advantage of multiple baseline design is that it does not require or depend on withdrawing treatment in order to prove that the behavior alteration is a function of the intervention. Therefore, there is no need to remove or temporarily pause the intervention for a while in order to demonstrate the functional relationship between an independent and dependent variable (Kazdin, 2011). This characteristic of multiple baseline design enables a researcher to assess the effect of interventions that cannot be withdrawn (Cooper et al., 2007), for example, like learning to read.

### **Visual Analysis in SCD**

Cooper et al., (2007) stated six advantages of graphic display and visual analysis. First, plotting each measure of behavior on a diagram immediately after the observation period allows a researcher to evaluate a participant's performance continually on visual record. Second, graphic display enables the researcher to examine interesting variations in behavior as they happen. Third, diagrams identify statistical analyses of behavior alteration; however, visual analysis of graphs takes less time and can make the information easier to decipher. Additionally, visual analysis does not depend on statistical assumptions. Fourth, visual analysis is considered to be a conservative method for determining the significance of behavior alteration. Therefore, behavior alteration is considered statistically significant due to the data plotted on a graph that detected the range, variability, trends, and overlaps in the data. Fifth, visual analysis is effective in showing independent judgments and explanations of the behavior change. Sixth, visual analysis also illustrates and offers an effective source of feedback.

There are a number of types of graphs used to display behavioral data. Commonly used graphic displays include *line graphs*, *bar graphs*, *cumulative records*, *semi-logarithmic charts*, and *scatter plots*. *Line graphs* are the model most commonly used (Cooper et al., 2007).

### **Visual Analysis of Data Considered Conservative in SCD**

Visual analysis of single-case data is the fundamental method of disseminating the effects of an independent variable or a dependent variable (Kahng et al., 2010). Visual analysis is more effective than tests of statistical significance because statistical procedures are less conservative and are more likely to produce Type I errors than visual analysis of data (Poling & Fuqua, 1986). In special education, researchers are concerned with producing socially significant behavior changes, and furthermore, are not interested in knowing that a behavior change was statistically significant based on the result of an intervention. Baer (1977a) reported, "If a problem has been solved, you can *see* that; if you must test for statistical significance, you do not have a solution" (p. 171). Visual analysis is completely appropriate to recognize variables that can be described as robust, large, and reliable and that contribute to an efficient, strong technology of behavior change. Otherwise, tests of statistical analysis can reveal the lower potential correlation between the independent and dependent variables; thus, it might contribute to weak or unreliable variables in the technology (Cooper et al., 2007).

There is potential for two types of errors that can impact results: Type I error and Type II error. A Type I error takes place when the researcher rejects a true null hypothesis. If the null hypothesis is true, it should not be rejected. Type I errors are called *false positives* due to the researcher wrongly concluding that a relationship exists in the experiment. A Type II error

occurs when the researcher fails to reject a false null hypothesis; if the null hypothesis is wrong, it is supposed to be rejected. Type II errors are called *false negatives* because the researcher wrongly concluded that no relationship exists (Johnson & Christensen, 2014). Therefore, in single-case design the researcher depends on visual analysis in order to confirm intervention effects, which results in low incidence of Type I error. However, there is a chance of "*increasing the commission of Type II errors*" (Cooper et al., 2007, p. 249). The researcher who depends on tests of statistical significance in order to assert intervention effects the most are committed to Type I errors more than the researcher using single-case design.

Visual analysis findings offer conservative conclusions regarding intervention effects. When compared to statistical inference, visual analysis yields a conservative result and impacts decision making (Campbell & Herzinger, 2010). For instance, Parsonson and Baer (1986) reported that research results appeared "*to imply that time-series analysis [a statistical technique] is usually less conservative than visual analysis*" (p. 159). A conservative decision results in a decrease in the probability of a Type I error (Campbell & Herzinger, 2010). Furthermore, it can be concluded that an effective functional relationship exists when in fact one does not. The conservative judgment that may result from visual analysis works as a "*filter*" in order to tease out weak intervention effects so that only strong intervention effects are applied. Therefore, the conservative affirmation of visual analysis corresponds with a differential tolerability for errors of inference: "*Type II errors are more acceptable than Type I errors*" (Campbell & Herzinger, 2010, p. 419). That is, ignoring small effects (i.e., Type II errors) is sometimes more desirable than wrongly concluding that effects are present when they in fact are not (i.e., Type I errors) (Campbell & Herzinger, 2010).

Overall, visual analysis has significant benefits, such as the ability of assessing an experimental effect conservatively, and finding variables that are primary and conducive to socially useful technology of behavior.

## Conclusion

In special education research, it is quite difficult to have a sufficient number of participants to gather randomly from the population. Based on a report by the US Department of Education, in 2015, the number of children and youth ages 3–21 receiving special education services in the United States was about 13 percent of all public school students. Children who were classified as deaf or hard of hearing make up 1% of the general education population (US Department of Education, 2015). Implementing group experimental designs in special education with heterogeneous low-incidence populations can be hard. On the other hand, a SCD does not demand a large number of participants, and so researchers can readily implement interventions with students who are receiving special education services in order to improve academic performance.

## Reference:

- Alberto, P.A. & Troutman, A. C. (2013) *Applied Behavior Analysis for Teachers*. (9<sup>th</sup> ed). Boston, MA: Pearson Education.
- Baer, D. M., Wolf, M. M., & Risley, T. R. (1968). Some current dimensions of applied behavior analysis. *Journal of Applied Behavior Analysis*, 1(1), 91-97.
- Baer, D. M. (1977). Perhaps it would be better not to know everything. *Journal of Applied Behavior Analysis*, 10(1), 167-172.
- Belfiore, P. J., Basile, S. P., & Lee, D. L. (2008). Using a high probability command sequence

- to increase classroom compliance: The role of behavioral momentum. *Journal of Behavioral Education*, 17, 160-171.
- Benedict, K. M., Rivera, M. C., & Antia, S. D. (2015). Instruction in metacognitive strategies to increase deaf and hard-of-hearing students' reading comprehension. *Journal of Deaf Studies and Deaf Education*, 20(1), 1-15
- Cakiroglu, O. (2012). Single subject research: applications to special education. *British Journal of Special Education*, 39(1), 21-29.
- Campbell J. M., Herzinger C. V. (2010). Statistics and single subject research methods. In Gast D. L. (Ed.), *Single subject research methodology in behavioral sciences* (pp. 417-453). New York, NY: Routledge.
- Cannon, J. E., Guardino, C., Antia, S. D., & Luckner, J. L. (2016). Single-case design research: Building the evidence base in the field of education of deaf and hard of hearing students. *American Annals of the Deaf*, 160(5), 440–452.
- Cooper, J., Heron, T., & Heward, W. (2007). *Applied behavior analysis* (2<sup>nd</sup> ed.). Upper Saddle River, NJ: Prentice Hall.
- Dimling, L. M. (2010). Conceptually-based vocabulary intervention: second graders' development of vocabulary words. *American Annals of the Deaf*, 155 (4), 425-448.
- Hammond, D. & Gast, D.L.(2010) Descriptive analysis of single subject research designs:1983–2007. *Education and Training in Autism and Developmental Disabilities*, 45(2), 187–202.
- Horner, R. H., Carr, E. G., Halle, J., McGee, G., Odom, S. L. & Wolery, M. (2005) The use of single-subject research to identify evidence-based practices in special education. *Exceptional Children*, 71, 165–179.
- Houston-Wilson, C., Dunn, J. M., Van Der Mars, H., & McCubbin, J. (1997). The effect of peer tutors on motor performance in integrated physical education classes. *Adapted Physical Activity Quarterly*, 14(4), 298-313.
- Johnston J.M, Pennypacker H.S. (2009) *Strategies and tactics of behavioral research* (3<sup>rd</sup> ed.) Hillsdale, NJ: Erlbaum.
- Johnson, B., & Christensen, L. (2014). Educational research: Quantitative, qualitative, and mixed approaches (5<sup>th</sup> ed.). Thousand Oaks, CA: SAGE Publications, Inc.
- Kazdin, A. E. (2011). *Single-case research designs: Methods for clinical and applied settings* (2<sup>nd</sup> ed.). Oxford, NY: Oxford University Press.
- Kennedy, C. H. (2005) *Single-Case Designs for Educational Research*. Boston, MA: Pearson Education.
- Kahng, S. W., Chung, K.-M., Gutshall, K., Pitts, S. C., Kao, J., & Girolami, K. (2010). Consistent Visual Analyses of Intrasubject Data. *Journal of Applied Behavior Analysis*, 43(1), 35-45.
- Kratochwill, T. R., Hitchcock, J., Horner, R. H., Levin, J. R., Odom, S. L., Rindskopf, D. M. & Shadish, W. R. (2010). Single-case designs technical documentation. Retrieved from What Works Clearinghouse website: [http://ies.ed.gov/ncee/wwc/pdf/wwc\\_scd.pdf](http://ies.ed.gov/ncee/wwc/pdf/wwc_scd.pdf).
- Mesibov, G. B., & Shea, V. (2011). Evidence-based practices and autism. *Autism*, 15(1), 114-133.
- Kratochwill, T. R., & Levin, J. R. (2010). Enhancing the scientific credibility of single-case intervention research: randomization to the rescue. *Psychological Methods*, 15, 2, 124-44.
- Neuman, S. B. & McCormick, S. (1995) *Single-Subject Experimental Research: applications for literacy*. Newark, DE: International Reading Association.
- Odom, S. L., Brantlinger, E., Gersten, R., Horner, R. H., Thompson, B., & Harris, K. (2005).

- Research in special education: Scientific methods and evidence-based practices. *Exceptional Children*, 2, 137–148.
- Paul, P., Wang, Y., & Williams, C. (2013). *Deaf students and the qualitative similarity hypothesis: Understanding language and literacy development*. Washington, DC: Gallaudet University Press.
- Poling, A. D., & Fuqua, R. W. (1986). *Research methods in applied behavior analysis: Issues and advances*. New York, NY: Plenum Press.
- Riley-Tillman, T. C., & Burns, M. K. (2009). *Evaluating educational interventions: Single-case design for measuring response to intervention*. New York, NY: Guilford Press.
- Plavnick, J. B., & Ferreri, S. J. (2013). Single-case experimental designs in educational research: A methodology for causal analyses in teaching and learning. *Educational Psychology Review*, 25(4), 549-569.
- Sealander, K. A. (2004) Single-subject experimental research: an overview for practitioners, in  
K. deMarrais and S. D. Lapan (eds), *Foundations for Research*. Mahwah, NJ: Erlbaum.
- Richards, S. B., Taylor, R. L., Ramasamy, R. & Richards, R. Y. (1999) *Single-Subject Research: applications in educational and clinical settings*. San Diego, CA: Singular.
- Risley, T. (2005). Montrose M. Wolf (1935–2004). *Journal of Applied Behavior Analysis*, 38,279–287.
- Tankersley, M., Harjusola-Webb, S. & Landrum, T. J. (2008) Using single subject research to establish the evidence base of special education, *Intervention in School and Clinic*, 44, 83–90.
- US Department of Education (2015) *Thirty-seventh Annual Report to Congress on the Implementation of the Individuals with Disabilities Education Act*. Washington, DC: US Department of Education [online at <http://www2.ed.gov/about/reports/annual/osep/2015/pa>

## **Empowering Students with Visual Impairment to Prepare for Disasters via Differentiated Instruction Technique: A Case Study in India**

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### **Abstract**

*Disaster risk management (DRM) education to visually impaired (VI) students has posed a great challenge to worldwide educators. International aid agencies report that people with disabilities have often been excluded from several educational interventions to manage disaster risks. It is, therefore, imperative to ensure that people with disabilities should not be forgotten in any disaster risk initiatives. Education can be a catalytic agent in bringing the disable population to the main stream. Many researchers propose that the process of inclusive emergency planning for DRM should begin at school. However, in most situations, a DRM course is prepared in a traditional way, i.e. for sighted students, and VI students are evaluated the same as sighted students. Thus, VI students remain largely neglected during the stages of instructional planning and learning. To address this issue we successfully designed and implemented an intervention strategy based on the differentiated instruction technique (DIT) to teach VI students about DRM. This article (i) explains how DIT can help instructors deliver DRM content to VI students, using a case study in a school in India, (ii) presents the challenges and solutions to such challenges when teaching DRM to VI students, and (iii) examines the VI participants' perceptions about learning DRM through DIT.*

**Keywords:** *Disaster risk management education, differentiated instruction technique (DIT), India, visually impaired students, empowerment*

## Introduction

According to the United Nations Children's Fund (UNICEF) (2003) and World Health Organisation (2011), about 15% of the world total population, about 10% of the young people in South Asian region have some form of disability. A recent figure also indicates that there are about 650 million people living with a disability (Disabled World, 2016). Mitchell (2014) explained that together with the minorities, women, children, the elderly, and people with disabilities, including the visually impaired (VI), have been the most adversely affected by both natural and man-made disasters (Good, Phibbs and Williamson, 2016; Islam, 2014). Article 11 of the *United Nations Convention on the Rights of Persons with Disabilities* has also highlighted the impact of disasters on people with disabilities (Ikeada, 1995; Islam, 2014). People with disabilities experienced higher rates of mortality, possessed little resources and have been neglected in normal conditions and during evacuation, relief, recovery and rehabilitation processes (Hosking et al., 2016; Mitchell, 2014; Rufal et al., 2015). The whole world has witnessed thousands of inhabitants, including the people with disabilities and other vulnerable people left behind due to lack of preparation, lack of evacuation plans, lack of equipment and several other reasons (Hutton, 2008).

Although with limited data (UNICEF, 2003), evidence suggests that people with disabilities have been marginalised, stigmatised, and discriminated in general, and from both immediate interventions and longer term recovery or rehabilitation programs (Todd and Todd, 2011; Back et al., 2016). International aid agencies report that people with disabilities have often been excluded from several educational initiatives (Odongo and Davidson, 2016), including educational programs and interventions to manage disaster risks (International Federation of Red Cross and Red Crescent Societies 2007; Ha, 2014; Ha and Jamil, 2014). Evidence of this exclusion appears in studies of Hurricane Katrina (2005), Cyclone Sidr (2007), and Haiti Earthquake (2010) (Eklund and Tellier, 2012). It is, therefore, imperative to ensure that people with disabilities should not be forgotten in any emergency evacuation plans and any disaster risk initiatives. Education can be a catalytic agent in bringing the disable population to the mainstream. We put forth that the process of inclusion in general, and in inclusive emergency planning for disaster management in particular should begin in the primary and secondary levels in the school system (Horne and Timmons, 2009). Many studies also agreed that disaster risk reduction should be taught at school (United Nations, 2007; United Nations Children's Fund, 2011).

The school curriculum of disaster management in India acquaints students with the types and causes of disasters, and disaster risk reduction through a social studies course. It is very disappointing that in most of the situations the curriculum and content lacks flexibility and is transacted in the traditional manner. All students are evaluated the same regardless their visual conditions, and in the same way as they are in other courses (UNICEF, 2003). In this situation, students with a visual impairment remain largely neglected during the stages of instructional planning and learning experiences. In other words, such students are not sufficiently “*included*” in the preparation for disaster risk management at school. Some general barriers to embracing such inclusion consist of lack of facilities and trained staff,

insufficient resources, and lack of technology (Chan and Yuen, 2015; Nimisha et al., 2016; Odongo and Davidson, 2016; Saleem and Sajjad, 2016). As a result, a life-saving content remains only at a very surface level for these VI students. To address this issue we have designed and successfully implemented an intervention strategy to teach VI students about disaster risk reduction based on the DIT.

This article, using a class in India as a case study, (i) explains how DIT can help instructors deliver the content to VI students, and (ii) presents the challenges faced when teaching topics related to disaster risk management to VI students. It also discusses solutions we have sought to address such challenges. Besides, we have also attempted to study the perceptions of the VI participants about learning this content through DIT. Specifically, two following research questions are addressed:

- What are the pedagogical issues and challenges involved in organising instructional intervention programs when teaching topics related to disaster risk management to VI participants?
- What are the perceptions of the VI participants about learning disaster risk management topics through DIT?

## Literature Review

### Disaster risk management education

One cannot avoid natural disasters, but disaster risks can be managed and reduced. Disaster risk management is imperative to reduce losses during and after disasters (Ha, Fernando and Mahmood, 2015; Inter-Agency Regional Analysts Network, 2016; Strayhorn et al., 2012). According to many authors, education to improve natural disaster resilience is imperative to any countries (Tilotta, 2010; Good, et al., 2016; Spink, 2017). UNESCO (2009) also explained that the right to education is universal and must be extended to all people, including people with disabilities.

Disaster prevention education has been adopted in many countries. In Taiwan, the Ministry of Education introduced the '*Pilot Programs to Promote Technological Disaster Prevention Education*' in 2003 to educate students on various topics with regards to natural disaster reduction, and building a culture of safety. A number of projects have also been launched, for example, '*Technological Disaster Prevention Education and Cultivation Experiment Research and Development Programs*' (Chen and Lee, 2012). However, these programs have not been designed especially for VI students. In Japan, school education, family, community and self-learning have been promoted to enhance the awareness and knowledge of the citizens and school students of natural disasters (Selby and Kagawa, 2012). In Iran, educational programs of disasters are incorporated in the school curricula of '*one year pre-school, five years of primary schools, three years of secondary schools, and four years of high schools*' (Parsizadeh and Ghafory-Ashtiany, 2010, p. 37). Further, educational information about disaster risk reduction has been disseminated via printed brochures, posters, audio tapes and newspapers by government agencies and other organisations (Parsizadeh and Ghafory-Ashtiany, 2010). Strayhorn, et al., (2012) reported that the pamphlets were an attractive media tool to disseminate information about natural disasters to the public. However, these means of broadcasting of information about disaster risk reduction

is not appropriate for the VI people.

Various instructional approaches have been adopted to educate students with regard to disaster preparation and reduction. For example, the concept of proactive co-learning has been introduced in Japan where teachers and students have worked with each other to develop the curriculum with regard to disaster education given the fact that not all schools have 'expertise on environment and disaster management' (Shiwaku and Shaw 2008, p. 189). Friedman, Rose and Koskan (2011, p. 240) discussed the delivery of a four three-hour module entitled '*Experiential Training in Disaster Communication with Vulnerable Populations*' to public health graduate students in an American university. Johansson and Nyberg (2013) explained that education and social learning can improve capacity in disaster risk management. The concept of integrated education, research and collaboration has been adopted by schools in Sweden to teach students about disaster risk reduction, climate change adaptation and flood risk management (Johansson and Nyberg, 2013). Yet, these programs have been conducted for non-VI students. In other words, there has been insufficient discussion on which methods are effective in teaching VI students at school. Further to this, VI students have to study with sighted students and that a teacher without relevant training does not have sufficient knowledge about inclusive education (Sharma and Desai, 2002; Sharma and Deppeler, 2005).

### **Differentiated instruction technique**

Tomlinson (1999, 2001, 2014) defined differentiation as a technique to tailor instructions to meet individual needs. It is an approach to teaching in which instructors proactively revise or modify content, delivery methods, and learning activities in a way which can address the needs of individual students in order to maximize their learning experience (Tomlinson et al., 2003). In other words, differentiated instruction is a process to teaching and learning for students of different abilities in the same class in which the instructors differentiate content, process, products, or the learning environment for meeting the students' individual needs. It is important to note that differentiated instruction does not mean that (i) instructors provide individualised instruction for every single learner in the program, and (ii) the instructions are designed only for students who are different from others (Kyriakides, 2007).

How to achieve educational effectiveness for all students in general, and in disaster risk reduction, in particular, has been one of the key issues in modern societies' educational systems. Research reveals that educational systems fail to meet the challenge of providing quality and equity, leading to an achievement gap between different groups of students (Strant, 1999). Evidence supports that the achievement gap increases during schooling (Fryer and Levitt, 2004). These findings prove that education has failed to fulfill its primary role and educational systems have not found the way to be effective for all. In order to achieve equity narrowing the achievement gap has been the main aim of socially directed educational systems (Sharma and Deppeler, 2005).

Although many curriculum reforms and policies were conducted based on providing and promoting equity through the enhancement of quality in education, the results of such efforts have not been very promising. Traditional approaches and undifferentiated instructive approaches which do not facilitate the construction of knowledge for all students in mixed-ability classrooms have been seen as one of the basic factors causing this problem. Supporters of DIT and its effectiveness asserted that DIT is an effective way for successful teaching for all students in mixed ability classrooms (Tomlinson, 1999, 2001). DIT guides the planning

and instruction in mixed-ability classrooms based on students' learning styles and their needs, facilitating the construction of knowledge for each and every learner based on their prior knowledge and dexterities (Felder and Brent, 2005). Hence, we chose the differentiated instruction method as an intervention strategy for increasing VI students' awareness about the hazards of different types of disasters and ways to deal with such hazards.

### **Research Method**

We adopted an interpretive qualitative research approach to gather and analyse the data collected through students' comments, and researcher' experiences. We employed the Interpretative Phenomenological Analysis (IPA) approach to gain insights into (i) the pedagogical issues associated with the use of DIT for the VI students, (ii) the way the VI students perceived and experienced learning of the topics 'Earthquake and Volcano' through the process of differentiation (Smith, 2008), and (iii) the interaction between VI students and sighted students. The IPA framework was designed by Smith, Jarman and Osborn (1999). As a qualitative research approach, IPA has its theoretical origins in phenomenology and hermeneutics. A researcher can adopt the IPA approach if the aim of the study is to explore individuals' perceptions as well as understand how such individuals make sense of their experiences. IPA requires researchers to closely examine the experiences and meaning-making activities of a small number of participants, for example, from 1 to 15 participants. The participants are selected based on their ability and subject knowledge to provide the researchers with meaningful insights into the topic of the study. The selected participants in an IPA study usually have certain experiences and/or share some common views with other participants in a given context, and from a shared perspective (Biggerstaff and Thompson, 2008; Smith and Osborn, 2008).

### **Participants**

It should be noted that there are insufficient empirical studies on disaster risk education for VI students (UNICEF, 2003). Thus, to ameliorate this situation, the purposive sampling method has been employed. The participants of this study were 10 VI female students in Class 8 of an integrated school situated in Mumbai, India. Among 10 students, seven were totally blind and three were partially sighted. It was their first year of study in an integrated educational environment. All of them had spent their earlier seven years of study in a special school for the blind. They studied along with other 30 sighted students in the same class in this integrated school.

In integrated schools the disabled students are just physically accommodated, and few special efforts made to facilitate their active involvement in class activities. We have adopted the DIT and designed the learning experiences as per the readiness level, learning styles and interests of all students, including the 10 visually impaired students.

### **Data collection and analysis**

The data for this study have been collected via (i) the researchers' field notes and self-reflections, and (ii) focus group interviews with the participants. The field notes were our observations of the VI participants in the learning process of the two topics related to disaster management, namely earthquakes and volcanoes. Specifically, we focused on the VI students' involvement in the learning tasks, and the group dynamics when doing group work with their sighted peers. Although these sighted students cannot help the VI classmates, but to some

extent, they do influence the learning process of the VI participants through the group interaction process. As suggested by Pearson et al. (2016), self-reflection is an important element in the process of professional development since “*it may contribute to a further sense of renewal, sustainability, and collaboration that may enhance teachers' ability to adapt to the continuing changing demands of the student population*” (p. 2). Thus, regarding the self-reflections, we have maintained the daily diary in which we used to write our daily reflections about what worked well, what did not work well and why, and what needs to be done to facilitate the successful functioning of the project. These reflections have helped us to address the research question, and produce the solutions for the challenges we have faced during the process.

The following questions were designed to obtain feedback from the VI students:

- (i) Did the instructional differentiation help you learn topics related to disaster risk management? In what way did it help you?
- (ii) Did you face any difficulties in learning these topics in spite of differentiated instructions?

### **Case Study**

#### **Justification and Significance**

A growing body of research has emerged in the last few years concerning the implementation and effectiveness of DIT (Jones, Yssel and Grant, 2012). However, there are hardly any studies in the context of India which throw some light on: (i) the pedagogical issues and challenges posed by inclusive learning strategies like differentiation, and (ii) solutions sought for VI students through instructional adaptation. Also, research on different instructions for VI students in the context of disaster risk reduction is rare. To promote the research-based practices (differentiated instruction, adaptation, supports, modifications, etc.) for fostering successful social and academic inclusion of VI students into the main stream (Sthapornnanon et al., 2009), the pedagogical issues and challenges associated with these practices need to be examined and reviewed. Hence, we fill this gap through this case study.

This case is offered as evidence of an instructional program which may seem to fit to a group of VI students who have to study with sighted students. Thus, the value of this case lies in its ability to provide an alternative perspective on the conventional and conceptual thought in disaster risk education to students with visual impairment.

#### **The intervention program**

The intervention program was designed to be offered over a two week period. The recipients of the program were VI students in Class 8 of an integrated school (i.e. VI students study with other students) in Mumbai, India. The intervention/model which was based on DIT revolved around two topics mentioned above, i.e. earthquakes and volcanoes. We named this model as ‘REACH’. It was a five-phase model, including

- R – Reflect on Will and Skill of students,
- E – Evaluate the Curriculum,
- A – Analyse the Students,

- C – Craft Research Based Lesson, and
- H – Hone students' skills after acquiring the information and knowledge.

The instructions in this model were differentiated in terms of selected content, instructional process and testing strategies for the VI students. We made optimum use of assistive technology for reaching out to the VI students as suggested by other researchers (e.g. Kelly, 2009; Wong and Cohen, 2011; Ahmad, 2015). We agreed with the views of Palincsar (1998) and Huang (2012) and used various group activities to help create a social constructivist learning environment. Every care was taken for building an emotional comfort zone for each learner, including the VI students.

## **Findings and Discussion**

This section presents the major findings and answers to the research questions. The IPA framework helped to derive the superordinate themes.

### **Research Question 1 - What are the pedagogical issues and challenges involved in organising instructional intervention programs when teaching topics related to disaster risk management to VI participants?**

To answer this question we used data from our reflections and notes. In the next section we discuss some major challenges faced and solutions sought by us while teaching the concepts of disaster management to the VI students.

## **Challenges and Solutions**

### ***Non accommodative course content***

The integrated schools in India usually use the same textbooks with the same content for both VI students and sighted students. The only difference is that they are made available in Braille print. Bhan (2012, 398) also explained that the '*government does not provide large print textbooks for students*' with partially visual impairment. As a result, we concur with the observations of Sharma and Deppler (2005) that these standardised text books do not only lack in appropriate graphical presentations, lack of flexibility, but even the content which the VI students can assess is also insufficient. It was noticed by the researchers that the special schools for the VI students also use the same textbooks, and they are made available in Braille print. As a result, these books do not only lack appropriate graphical presentations, but the content and the vocabularies used in the content is not at all accommodative (Hernández, 2003). For example, the text may be '*look at the picture of the volcano and observe the intensity of the eruption*', or it may refer to the concepts of earthquake faults, plate tectonics and plate boundaries. However, the pictures to illustrate such concepts are missing in Braille books. Besides, the description given in the Braille book refers to the visual content (e.g., photos, diagrams, etc.) in the book which is meant for the sighted students, not for the VI students. Such unprocessed content becomes very non accommodative for the VI learners. Hence, the content largely remains out of reach for the VI students.

To solve this issue we did a thorough content analysis of the topics related to disaster risk, identified the complex areas, and provided textual and linguistic scaffolds by creating new learning material. We introduced graphics in a tactile form. Separate audio content regarding relevant topics was also made available for the VI students. The models used Braille labels.

All these changes helped the VI students to access the required information for learning the course.

### ***Lack of resources***

The school selected for the experiment did not have sufficient learning resources like models, charts, etc. Whatever they had also was not in a good working condition which was also raised by Sharma and Deppele (2005) and as an issue in learning. For the problem of lack of resources we developed theme wise models and materials in 2D forms. These documents/materials were produced in multiple copies since each VI student needs a different timeframe and different timing to explore the content in the material. This aimed to avoid chaos in the classroom if only one set of the learning resources was available.

### ***Class management***

There were three issues with regard to class management in this case. The first issue was grouping. Differentiated instructions in this project took a path of a guided discovery learning which required the self-exploration of the materials in Braille or in audio and tactile forms. It also required the VI students to work at the work stations together with other group members which caused much difficulty to them. It was, at times, risky to for them touch and feel the chemical solutions used for simulations.

Lack of time was the second issue. Guided discovery required more time for explorations and analysis which could not be fitted in a regular class period of 30 minutes in the context of India.

Finally, the class setting was also a challenge. As put forth by Taylor and Parsons (2011), the discovery learning process required constant interaction between the group members. The students were required to touch the models, access the materials and take part in the discussions. It was difficult for the VI students to move around in a regular classroom setting with traditional furniture and this is noted by an UNESCO study (2009).

To overcome the above challenges, we divided the students into groups. Each group had totally VI and partially VI students, and we assigned each group some sighted students. We ensured that at least one group member in each group could read Braille fluently or could access the learning material comfortably. We requested the school to schedule additional time when teaching these sessions. The students and co-teachers also willingly waited for working at the work stations even after the school hours. We also requested the school to provide us with an empty room with only a few pieces of furniture to create the work stations so that the students could freely move around with their group members in the room for performing the class activities and solving the given problems. It was noted that school management in many Indian schools, in normal conditions, willingly made some minor adjustments to accommodate the VI students' learning difficulty.

### ***Lack of discovery and collaborative learning skills***

According to the research findings by Reeves (2006), and Taylor and Parsons (2011), VI students could best learn the content when (i) they are involved in first-hand exploration and investigation; (ii) discovery/process skills are nurtured; and (iii) the instruction is built directly on the student's conceptual framework and cognitive mapping.

When engaging in guided discovery, students are expected to describe objects and events, ask questions, construct explanations, test those explanations against current scientific knowledge, and communicate their ideas to others. They identify their assumptions, use critical and logical thinking, and consider alternative explanations. Despite widespread agreement on the importance of guided discovery learning, it was difficult to adopt this pedagogical approach in classrooms with VI students. Initially, we found that students getting disruptive, paying less or no attention, or simply not participating. We were aware of the fact that although the VI students have been studying in an integrated school, neither the sighted students nor the VI students were used to working in a collaborative environment (Sharma and Deppeler, 2005). This created the initial gap in the interaction among the two groups when studying the topics on disaster management.

In order to address this challenge, we adopted easily guided discovery steps in which students made transition from one state to another with the help of structured observations, interpretations and conclusions. For promoting collaboration among all the students, purposeful steps were taken by orienting the students to the importance of collaboration and group skills. We also introduced frequent ‘ice breakers’ sessions during the class to bring the VI students and the sighted students together.

### ***Equality of Learning Experience***

Another key challenge we faced was how the totally as well as partially VI students could get a comparable learning experience to sighted students (see Silver, Bourke and Strehorn 1998). As mentioned previously, out of 10 students, seven did not have any functional vision and only three had partial vision. The stated aims of the guided discovery learning stress the importance of exploration of information, observation of the processes and generalisation on the bases of these observations. As stated by other researchers (Shernoff, et al., 2003; Taylor and Parsons, 2011), it is necessary that all the students irrespective of their vision conditions should have been engaged in the process of discovery rather than simply being present in a session. The obvious problem was the visual nature of concepts related to the earthquakes and volcanos.

In this situation, having sighted assistants to describe the visual elements was an obvious and effective solution. Hands-on experience depended on a large degree on the nature of the models and instructional material. In a two-hour session, there was relatively sufficient time for the students to explore the content, the models and other materials related to the topics. Where it was impossible for the totally VI students to manually do the class activities, they instructed the sighted assistant to do it for them. In some situations, the use of audio description of the graphics made the totally blind students enthusiastic, and actively engaged them in the discovery process. Thus, the sighted assistance, flexibility and assistive technology helped us to overcome this challenge as explained by Saleem and Sajjad (2016) that assistive technology contributes to VI students’ academic success and ‘social interaction’ (p. 52). Apparently, social support, i.e. the assistance from the sighted participants, helped the VI student to enhance their learning experience and performance (Keb, 2002).

### ***Assessment***

As stated by Salvia, Ysseldyke and Bolt (2010) differentiated instructional strategy helped us adopt an appropriate approach to select specific assessment techniques to test the VI students. The nature of the assignments for VI students was very often auditory; for example, preparing

a radio program on '*Taking precision before, during and after earthquakes*', or '*Visiting a volcano prone area*, etc. Here, the challenges were multi-faceted, for instance: (i) how could we assess the discovery learning among the VI students?, (ii) how could the international standard of marking criteria be applied to the VI students (who have a sighted assistant) in the same way as to other students?, and (iii) how strictly the marking criteria should be followed?

We decided to assess the students based on the three criteria: (i) discovery skills, (ii) conceptual understanding, and (iii) group oral presentations (see Sharma and Desai, 2002). The first criterion, discovery skills, was marked based on whether the student participated in the following activities, namely (i) asking questions, (ii) accessing information, (iii) sorting information, and (iv) reporting finding. The totally as well as partially sighted students scored well on this criterion. The second criterion, conceptual understanding, was assessed based on the students' understanding of the content of the two topics related to disaster management, and their ability to perform certain practical activities. Initially, the VI students presented a very sketchy note on the assigned tasks. Their work was assessed in a way that it took into considerations their ability to provide a comprehensive written account without being able to visualise earthquakes and/or volcanoes. However, apart from additional assistance to improve their learning experience, no leeway was given to the VI students when they prepared for the actual test papers. The final criterion, group oral presentations, was straightforward in assessment. We evaluated the students against certain dimensions like content clarity, logical organisation of the content and group coordination.

Overall, there were several pedagogical issues and challenges when we have applied the DIT to teach disaster management related topics to the VI students. However, with some flexibility, effective use of assistive technology, and, to some extent, the help of the sighted assistants, we could successfully teach these concepts to the VI students.

### **Research Question 2 - What are the perceptions of the VI participants about learning disaster risk management topics through DIT?**

To answer this question, we conducted focus group interviews with the VI participants. The following superordinate themes became evident after the analysis of the qualitative data collected from the interview.

#### ***Unquestioned trust in the students***

This was a very prominent theme which emerged from the interviews. All the participants unanimously felt that the researchers (instructors) showed a lot of trust in them. For confidentiality and privacy, we referred to the participants by using coding, i.e. using the first letter of their surnames. S. said that:

*For the first time someone has allowed us to touch the models, and apparatus independently. Earlier we were never allowed to touch the things on our own.*

K. explained that:

*We were not scared of touching things as we knew that the facilitators are supportive and if anything would go wrong no one would scold us.*

Several of the students mentioned how surprised they were when the researchers allowed

them to actually work hands-on with the models, graphics, etc. Similarly to other young people and other VI people, these VI students have a strong desire to try doing things by themselves without any assistance, i.e. to be empowered or autonomous (Winchitz, 2004; Saldaña, 2016). N. mentioned that:

*People do not let me do things (by) myself. They would either put their hands over mine or show me, or they would just do it by themselves; and (they do) not let me do it at all. So, I think this was great.*

By allowing the students to work on their own and develop confidence with some expensive and delicate equipment, the researchers showed the group that they were genuinely interested in the group's learning experience. Similarly to the findings of Taylor and Parsons (2011), this fostered an atmosphere in which the VI students felt very comfortable to share what they did not know by asking questions. V. specifically found the collaborative grouping quite helpful to her learning experience. She said that:

*You felt like you could ask anything, and you wouldn't be made fun of by anyone. In classroom you still feel uncomfortable, and the teachers don't have a lot of time to answer all the questions you have!*

All the VI students experienced the warmth of the friendship with the sighted students, and this is consistent with the findings by Nyoni, Marashe and Nyoni (2011). This experience was different when they studied in a normal class because they were hardly working with the sighted students. M. said that:

*I never thought that the sighted students of our class also care for us. Other times they hardly talk to us.*

### ***Enriching moments of learning***

All the participants found the learning experiences during the project very enriching. This was evidenced via the comment by D.:

*It was great to touch the volcano eruption and feel the earthquakes.*

V. also added that:

*Whatever I could "see" in movie on volcano was very exciting.*

N also agreed with her friends and said that:

*It was interesting to touch each instrument and the model and feel their surface in the tactile diagrams.*

Apparently, the differentiated instructional technique produced a special learning experience, and improved students' satisfaction via their positive feedback. This is consistent with the study by Watts-Taffe et al. (2011).

### ***Positive and ‘willing’ attitude of the Researchers***

The VI participants appreciated that the researchers were very willing to understand and acknowledge the problems faced by them, and that researchers/instructors were very prompt to make changes in the classroom activities. M. explained that:

*The facilitators asked me whether I could understand the concepts, what changes I need in the diagrams or models. Nobody has asked me like this before.*

N. also felt the same and said that:

*The project teachers were always ready to know about my problems and they always asked me how I would have liked to be taught. They do so much for us.*

Every participant rated the project a huge success. Clearly, partnering the VI students who were eager to learn with experts (the instructors) in a particular field is not an easy task. At the same time, it was the energy, enthusiasm, creativity, and open mindedness of all the direct stakeholders, such as the researchers, the VI students as well as the sighted students in the same class, that allowed this experience to become a good example and an inspiration for future endeavour of applying this type of instructional technique in teaching other topics related to disaster risk management.

### **Lessons Learned from the Case**

Overall, there were several pedagogical issues and challenges when we applied DIT to teach disaster management related topics to VI students. However, with some flexibility, effective use of assistive technology, and, to some extent, the help of the sighted assistants, we successfully taught these concepts to the VI students. Our daily observations and reflections also showed that the VI students actively participated in the learning engagement, and displayed lot of enthusiasm during the sessions. Our results support the earlier research that proved the positive impact of the DIT on academic performance of students (Rock et al., 2008; Tomlinson, 1999b). The positive aspect of the DIT was reflected through the significant improvement in the marks of the VI students after attending the program (see Table 1). The standard deviation ranges from +5 to +9.

**Table 1: Marks of the VI students before and after the attending the program**

Student	Mark before attending the program	Mark after attending the program	Standard deviation
1	12	19	+7
2	11	17	+6
3	14	22	+8
4	10	19	+9
5	12	20	+8
6	14	23	+9
7	13	20	+7
8	14	19	+5
9	13	22	+9
10	13	21	+8

Nevertheless, we learned several important lessons through the experimental experiences as follows:

## **Teaching the VI students**

We, as the educators and researchers, should not work with any rigid assumptions about the ability of the disabled students. As explained by Kirk et al. (2012), teachers/instructors need to be aware of the factors which affect VI students' learning experience.

We need to ask them about their concerns, and adopt different instructional strategies and techniques to suit each group of students. Importantly, we should make the VI students as partners in the voyage of teaching and learning, i.e. promoting co-creation in teaching and learning, instead of treating them as passive receivers of the message (Bovill et al., 2015). We also need to make disaster risk education accessible to all groups of students.

## **Positive attitude of the sighted students toward the VI students**

The younger students are very adaptive and flexible, and they quite easily accept and support their VI peers. We think that the interaction with the VI students would change the attitude of the sighted participants towards VI people for the rest of their lives. The interaction is not only for academics but also provides valuable live lessons for sighted students. Thus, an inclusive policy regarding education on disaster risk management should be applied at school, and at an early stage, for all students (Federal Ministry for Economic Cooperation and Development, Davison for Public Relations, Information and Education, 2013). Such policy should be institutionalised within and across institutions so that the young generation can be more sensitive towards the needs of their VI counterparts in the classroom setting.

## **Designing an alternative mode of examination**

Since VI students have different learning styles, and face many challenges during the learning process as Sharma and Desai (2002) rightly point out VI students should be assessed in different modes. Therefore, it is essential to establish a substitute system of examination for the VI students. We agree with Sharma and Deppeler (2005) that an appropriate examination mode should ask the VI students to do activities which can exhibit their abilities to respond to disaster risks in different situations.

## **Develop new generation of educators who embrace inclusive education**

The teacher education institutions should take a lead to make the prospective teachers as champions of the inclusive learning as proposed by Jangira (1995). Sharma and Deppeler (2005, p. 36) also explained that 'attitudinal barriers engrained as part of India's historical response to disability must be changed through education programs for both teachers and the general populace'.

## **Conclusion**

Systematic research on disaster risk management education and the VI students in India is insufficient or almost non-existent. Available documents propose that there has been across-the-board neglect and a lack of suitable instructional models when teaching topics related to disaster risk management to VI students. Thus, this paper has discussed the motivation of this research study, and how DIT was adopted to educate VI participants about disaster risk

reduction. This article has highlighted that the impairments of the VI students should not be treated as barriers to disaster risk management education but as challenges for educators to find new and innovative approaches to educate disaster risk reduction and preparation to VI students.

It is essential for disability studies and disaster risk management education to be incorporated and examined concurrently in order to provide equal opportunities for the VI people to access to information and receive education in all stages of disaster response, rehabilitation and recovery. The most effective way to improve disaster risk management education through the eyes of the VI people is to truly and sincerely engage them in the teaching and learning process as active students, not as passive recipients. In this aspect, the DIT can be adopted as one of the effective techniques to disaster risk management education.

One of the limitations of this study is the small sample size of the VI participants. Thus, further research should expand the scope of this study, i.e. to select a bigger sample size across schools and across provinces in a country as well as across countries.

## References

- Ahmad, F. K. (2015). Exploring the Invisible: Issues in Identification and Assessment of Students with Learning Disabilities in India. *Transcience: A Journal of Global Studies*, 6(1), 91-107.
- Back, L. T., Keys, C. B., McMahon, S. D. & O'Neill, K. O. (2016). How We Label Students with Disabilities: A Framework of Language Use in an Urban School District in the United States. *Disability Studies Quarterly*, 36(4). DOI: <<http://dx.doi.org/10.1806/dsq.v36i4.4387>>
- Bhan, S. (2012). Inclusion of Children with Visual Impairment in India. *European Journal of Social & Behavioural Sciences*. III(3), 387-408. [http://dx.doi.org/10.15405/FutureAcademy/ejsbs\(2301-2218\).2012.3.3](http://dx.doi.org/10.15405/FutureAcademy/ejsbs(2301-2218).2012.3.3)
- Biggerstaff, D. & Thompson, A. R. (2008). Interpretative Phenomenological Analysis (IPA): A Qualitative Methodology of Choice in Healthcare Research. *Qualitative Research in Psychology*, 5(3), 214-224. <http://dx.doi.org/10.1080/14780880802314304>
- Bovill, C., Cook-Sather, A., Felten, P., Millard, L. & Moore-Cherry, N. (2015). Addressing potential challenges in co-creating learning and teaching: overcoming resistance, navigating institutional norms and ensuring inclusivity in student-staff partnerships. *Higher Education*, May 2015. <http://dx.doi.org/10.1007/s10734-015-9896-4>
- Chan, T. & Yuen, M. (2015). Inclusive education in an international school: a case study from Hong Kong. *International Journal of Special Education*, 30(3), 86-97.
- Chen, C-Y. & Lee, W-C. (2012). Damages to school infrastructure and development to disaster prevention education strategy after Typhoon Morakot in Taiwan. *Disaster Prevention and Management*, 21(5), 541-55. <http://dx.doi.org/10.1108/09653561211278680>

Disabled World. (2016). Disability Statistics: Facts & Statistics on Disabilities & Disability Issues. <http://www.disabled-world.com/disability/statistics/>.

Eklund, L. & Tellier, S. (2012). Gender and international crisis response: Do we have the data, and does it matter? *Disasters*, 36(4), 589-608. Doi: 10.1111/j.1467-7717.2012.01276.x

Federal Ministry for Economic Cooperation and Development (BMZ), Davison for Public Relations, Information and Education. (2013). *Disaster risk management for all: The inclusion of children, elderly people and people with disabilities*. Bonn and Berlin, Germany: Federal Ministry for Economic Cooperation and Development (BMZ), Davison for Public Relations, Information and Education.

Felder, R. M. & Brent, R. (2005). Understanding Student Differences. *Journal of Engineering Education*, 94 (1), 57-72. [http://www4.ncsu.edu/unity/lockers/users/f/felder/public/Papers/Understanding\\_Differences.pdf](http://www4.ncsu.edu/unity/lockers/users/f/felder/public/Papers/Understanding_Differences.pdf)

Friedman, D.B., Rose, I. D. & Koskan, A. (2011). Pilot assessment of an experiential disaster communication curriculum. *Disaster Prevention and Management*, 20(3), 238-250. Doi: 10.1108/09653561111141691

Fryer, R. G., Jr. & Levitt, S. D. (2004). Understanding the Black-White test score gap in the first two years of school. *Review of Economics and Statistics*, 86, 447-464. Doi: 10.3386/w8975

Good, G. A., Phibbs, S. & Williamson, K. (2016). Disoriented and Immobile: The Experiences of People with Visual Impairments during and after the Christchurch, New Zealand, 2010 and 2011 Earthquakes. *Journal of Visual Impairment & Blindness*, 110(6), 484. <http://search.proquest.com.ezproxy.newcastle.edu.au/docview/1847925565/fulltext/63E53BB9A5A4329PQ/1?accountid=10499>

Ha, H. (2014). Land Use and Disaster Governance in Asia: An Introduction. In H. Ha (ed.) *Land and Disaster Management in Asia*. Springer, New Delhi. pp. 1-12.

Ha, H., & Suriani Jamil. (2014). Disaster Risk Management and Public Education and in Singapore. In H. Ha (Ed.), *Land and Disaster Management Strategies in Asia* (pp. 171-188). Germany/New Delhi: Springer.

Ha, H., Fernqando, L. & Mahmood, A. (2015). Strategic Disaster Risk Management in Asia: An Introduction. In H. Ha, L. Fernando & A. Mahmood (Eds.), *Strategic Disaster Risk Management in Asia* (pp. 1-13). Germany/New Delhi: Springer.

Hernández, A. (2003). "Making Content Instruction Accessible for English Language" In *English Learners: Reaching the Highest Level of English Literacy* edited by G.C. 125-149. Newark, DE: International Reading Association.

Horne, E. P., & Timmons, V. (2009). Making it work: teachers' perspectives on inclusion. *International Journal of Inclusive Education*, 13, 273-286.

Hosking, F. J., Carey, I. M., Shah, S. M., Harris, T., DeWilde, S., Beighton, C. & Cook, D. G. (2016). Mortality among Adults with Intellectual Disability in England: Comparisons with the General Population. *American Journal of Public Health*, 106(8): 1483-1490. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4940652/>

Huang, E. (2012). Toward constructivism for adult learners in online learning environments. *British Journal of Educational Technology*, 33(1). 27-37. DOI: 10.1111 /1467-8535.00236

Hutton, D. (2008). *Older people in emergencies: Considerations for action and policy development*. Geneva: World Health Organization.

Ikeda, K. (1995). Gender differences in human loss and vulnerability in natural disasters: a case study from Bangladesh. *Indian Journal of Gender Studies*, 2(2), 171-193. doi: 10.1177/097152159500200202

Inter-Agency Regional Analysts Network (2016). *The Sendai Framework for Disaster Risk Reduction: A three year outlook (2016-2018) at a global shift*. Paris and London: Institut De Relations Internationales et Stratégiques and Action Against Hunger.

International Federation of Red Cross and Red Crescent Societies. (2007). *World Disaster Report 2007: Focus on Discrimination*, International Federation of Red Cross and Red Crescent Societies. Bern, Switzerland: International Federation of Red Cross and Red Crescent Societies.

Islam, M. S. (2014). “Deficiency of Disability Issue in Disaster Risk Reduction Strategy: Implications on Human Security and Social Cohesion” In *Land and Disaster Management in Asia* edited by Huong Ha, 111-120. New Delhi: Springer.

Jangira, N. K. (1995). ‘Rethinking teacher education. *Prospects*, 25(2), 261-272.

Johansson, M. & Nyberg, L. (2013). Using education and social learning in capacity building – the IntECR concept. *Disaster Prevention and Management*, 22(1), 17-28.

Jones, R. E., Yssel, N. & Grant, C. (2012). Reading Instruction in Tier 1: Bridging the Gaps by Nesting Evidence-Based Interventions within Differentiated Instruction. *Psychology in the Schools*, 49(3), 210-218. DOI: 10.1002/pits.21591

Keb, S. (2002). Psychosocial Adjustment and the Meaning of Social Support for Visual Impairments Adolescents. *Journal of Visual Impairment and Blindness*, Jan (2002), 22-37.

Kelly, S. M. (2009). Use of assistive technology by students with visual impairments: Findings from a national survey. *Journal of Visual Impairment and Blindness*. 103, 470-480. <http://www.editlib.org/p/105436/>

Kirk, S., Gallagher, J., Coleman, M. R. & Anastasiow, N. (2012). *Educating Exceptional Children* (13<sup>th</sup> ed.). Wadsworth: Cengage Learning.

Kyriakides, L. (2007). “Generic and Differentiated Models of Educational Effectiveness: Implications for the Improvement of Educational Practice’ In *International Handbook of School Effectiveness and Improvement* edited by T. Townsend, 41-56. Dordrecht, the

Netherland: Springer.

Mitchell, D. & Karr, V. (eds.). 2014. *Crises, Conflict and Disability: Ensuring Equality*. London and New York: Routledge (Advances in Disability Studies).

Nimisha, M., Drager, K. D. R. & O'Connor, L. (2016). Special Education in Sri Lanka: A snapshot of three provinces. *Disability Studies Quarterly*, 36(2). DOI: <http://dx.doi.org/10.18061/dsq.v36i2.4388>

Nyoni, M., Marashe, J. & Nyoni, T. (2011). The Quest for Inclusive Education: The Case of Pakame High School. *Journal of Sustainable Development in Africa*, 13(1), 278-294. [http://www.academia.edu/1765475/The\\_Quest\\_for\\_Inclusive\\_Education\\_The\\_Case\\_of\\_Pakame\\_High\\_School\\_Shurugwi\\_District\\_in\\_Zimbabwe](http://www.academia.edu/1765475/The_Quest_for_Inclusive_Education_The_Case_of_Pakame_High_School_Shurugwi_District_in_Zimbabwe)

Odongo, G. & Davidson, R. (2016). Examining the Attitudes and Concerns of the Kenyan Teachers Toward the Inclusion of Children with Disabilities in the General Education Classroom: A Mixed Methods Study. *International Journal of Special Education*, 31(2), 209-227.

Palincsar, A. S. (1998). Social constructivist perspectives on teaching and learning. *Annual Review of Psychology*, 49, 345-375. DOI: 10.1146/annurev.psych.49.1.345

Parsizadeh, F. & Mohsen, G-A. (2010). Iran public education and awareness program and its achievements. *Disaster Prevention and Management*, 19(1), 32-47.

Pearson, H., Cosier, M., Kim, Joanne J., Gomez, Audri M., Hines, Carol, McKee, Aja A., Ruiz, Litzy Z. (2016). The impact of Disability Studies curriculum on education professionals' perspectives and practice: Implications for education, social justice, and social change. *Disability Studies Quarterly*, 36(2). <http://dsq-sds.org/article/view/4406/4304>

Reeves, T. C. (2006). How do you know they are learning? The importance of alignment in higher education. *International Journal of Learning Technology*, 2(4), 302-304.

Rock, M., Gregg, M., Ellis, E. & Gable, R. A. (2008). REACH: A framework for Differentiating classroom instruction. *Preventing School Failure*, 52(2), 31-47. [https://libres.uncg.edu/ir/uncg/f/M\\_Rock\\_REACH\\_2008.pdf](https://libres.uncg.edu/ir/uncg/f/M_Rock_REACH_2008.pdf)

Rufat, S., Tate, E., Burton, C. G. & Maroof, A. S. (2015). Social vulnerability to floods: Review of case studies and implications for measurement. *International Journal of Disaster Risk Reduction*, 14(4), 470-486.

Saldaña, C. (2016). Children with Disabilities: Constructing Metaphors and Meanings through Art. *International Journal of Special Education*, 31(1), 88-96.

Saleem, S. & Sajjad, S. (2016). The Scope of Assistive Technology in Learning Process of Students with Blindness. *International Journal of Special Education*, 31(1), 46-54.

Salvia, J., Ysseldyke, J. & Bolt, S. (2010). *Assessment in special and inclusive education* (11th ed.). Boston: Houghton Mifflin.

Selby, D. & Kagawa, F. (2012). *Disaster Risk Reduction in School Curricula: Case Studies from Thirty Countries*. Paris, France and Geneva, Switzerland: UNESCO and UNICEF.

Sharma, U. & Desai, I. (2002). Measuring concerns about integrated education in India. *Asia and Pacific Journal on Disability*, 5(1), 2-14.

Sharma, U. & Deppeler, J. (2005). Integrated Education in India: Challenges and Prospects. *Disability Studies Quarterly*, 25(1), <http://dsq-sds.org/article/view/524/701>

Shernoff, D. J., Csikszentmihalyi, M., Schneider, B. & Shernoff, E. (2003). Student Engagement in High School Classrooms from the Perspective of Flow Theory. *School Psychology Quarterly*, 18(2), 158-176. <https://cmsce.rutgers.edu/sites/cmsce.rutgers.edu/files/shernoff.et.al.2003.pdf>

Shiwaku, K. & Shaw, R. (2008). Proactive co-learning: a new paradigm in disaster education. *Disaster Prevention and Management*, 17(2), 183-198.

Silver, P., Bourke, A. & Strehorn, K. (1998). Universal Instruction Design in HE: an approach for inclusion. *Equity and Excellence in Education*, 31, 47-51. <http://journals.sagepub.com/doi/abs/10.1177/07419325030240060801>

Smith, T. J. (2008). Senior Citizens and E-commerce Websites: The Role of Perceived Usefulness, Perceived Ease of Use, and Web Site Usability. *Informing Science: the International Journal of an Emerging Transdiscipline*, 11(2008), 59-83.

Smith, J. A. & Osborn, M. (2008). "Interpretative Phenomenological Analysis" In *Qualitative Psychology: A Practical Guide to Research Methods* (2<sup>nd</sup> ed.) edited by J.A. Smith, 53-80. London: **SAGE Publications Ltd.**

Smith, J.A., Jarman, M. & Osborn, M. (1999). "Doing interpretative phenomenological analysis" In *Qualitative Health Psychology* edited by M. Murray and K. Chambertain, 218-240. London: Sage.

Spink, E. (2017). When it comes to disaster preparedness for people with disabilities, can we do better? Fairfax New Zealand Limited. <http://www.stuff.co.nz/national/88383361/when-it-comes-to-disaster-preparedness-for-people-with-disabilities-can-we-do-better>

Shapornnanon, N., Sakulbumrungsil, R., Theeraroungchaisri, A. & Watcharamrongkun, S. (2009). Social Constructivist Learning Environment in an Online Professional Practice Course. *American Journal of Pharmaceutical Education*, 73(1), 1-9. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2690880/>

Strand, S. (1999). Ethnic group, sex and economic disadvantage: Associations with pupils' educational progress from Baseline to the end of Key Stage 1. *British Educational Research Journal*, 25, 179-202. DOI: 10.1080/0141192990250204

Strayhorn, T., Dasmohapatra, S., Tilotta, D. & Mitchell, P. (2012). Effectiveness of educational tools for hurricane resilience in homes. *Disaster Prevention and Management*, 21(4), 433-444. <http://dx.doi.org/10.1108/09653561211256143>

Taylor, L. & Parsons, J. (2011). Improving Student Engagement. *Current Issues in Education*, 14(1), 1-32. <http://cie.asu.edu/>

Tilotta, D. C. (2010). "The Resilient Home Program." Paper presented at the 4th Annual DHS University Network Summit Conference, Washington, D.C., March 10. [http://www.orau.gov/dhssummit/2010/presentations/March10/Panel08/tilotta\\_david.pdf](http://www.orau.gov/dhssummit/2010/presentations/March10/Panel08/tilotta_david.pdf)

Todd, D. & Todd, H. (2011). *Natural Disaster Response Lessons from Evaluations of the World Bank and Others*. Washington, D.C.: World Bank.

Tomlinson, C.A. (1999). Leadership for differentiated classrooms. *The School Administrator*, 56(9), 6-11.

Tomlinson, C. A. (2001). *How to differentiate instruction in mixed-ability classrooms* (2nd ed.). Alexandria, VA: Association for Supervision and Curriculum Development.

Tomlinson, C. A. (2014). *The differentiated classroom: Responding to the needs of all students*. Alexandria, VA: Association for Supervision and Curriculum Development.

Tomlinson, C. A., Brighton, C., Hertberg, H., Callahan, C. M., Moon, T. R., Brimijoin, K., Conover, L. A. & Reynolds, T. (2003). Differentiating instruction in response to student readiness, interest, and learning profile in academically diverse classrooms: A review of literature. *Journal for the Education of the Gifted*, 27, 119- 145. <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.464.5372&rep=rep1&type=pdf>

UNESCO. (2009). *Teaching Children with Disabilities in Inclusive Settings*. Bangkok: UNESCO.

United Nations. (2007). *Towards a Culture of Prevention: Disaster Risk Reduction Begins at School - Good Practices and Lessons Learned*. New York United Nations.

United Nations Children's Fund (UNICEF). (2003). *Examples of Inclusive Education*. Kathmandu, Nepal: The United Nations Children's Fund (UNICE).

United Nations Children's Fund (2011). *Disaster Risk Reduction and Education*. New York: United Nations Children's Fund.

Watts-Taffe, S., Laster, B. P., Broach, L., Marinak, B., Connor, C. M. & Walker-Dalhouse, (2011). Differentiated Instruction: Making Informed Teacher Decisions. *The Reading Teacher*, 66(4), 303-314. <http://www.bayschools.com/Portals/25/Reading/Differentiated%20Instruction.pdf>

WHO. (2011). *World report on disability*. World Health Organization, Geneva.

Wong, M. E. & Cohen, L. (2011). School, family and other influences on assistive technology use: Access and challenges for special school students with visual impairments in Singapore. *British Journal of Visual Impairment*, 29(2), 130-144.

## **Autism and Technology: Investigating Elementary Teachers' Perceptions Regarding Technology Used with Students with Autism**

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### **Abstract**

*Despite extensive scholarship on the importance of using technology in classrooms, little has been done to explore teachers' perceptions towards using technology with individuals diagnosed with autism spectrum disorders (ASD). The purpose of this study was to examine teachers' attitudes towards the use of technology for students with autism. Data were collected through semi-structured interviews with seven elementary school teachers who taught students diagnosed with autism. Findings revealed the majority of teachers (six of the seven participants) are in favor of using technology in the classroom and believe that it can have a positive impact on students' learning experiences. A thematic analysis revealed three themes: teacher's attitudes towards using technology, benefits of incorporating technology in the classroom, and the different skills technology helps students to develop.*

**Keywords:** *Autism, teachers, students, classroom, technology, computer, iPad, and smart board*

### **Introduction**

The rapid increase of instructional technologies has positively changed education, demonstrating their effectiveness by improving students' focus, facilitating task completion, and increasing student learning. Specifically related to student learning, Krinic, Vidacek-Hains, and Kovacic (2010) claim that "*computer-aided education has largely proven to be more effective and efficient, primarily owing to additional motivation enhanced by the interaction with the computer*" (p. 2). Additionally, for teachers, technology has facilitated planning and assessment (Eckhouse & Carroll, 2013). Educational experts have been quick to research technology in the general education classroom, examine the benefits that result from

its incorporation into all aspects of instruction, and create space for various creative activities that teachers are able to develop for their students (Wu et al., 2013).

Research on the positive impact technology has on education has not only been prevalent with typically developing students, but has also demonstrated its effectiveness for students with special needs (Tibi, 2012). In the special education classroom, technology has improved the educational experience by providing students with special needs with the opportunity to perform tasks and improve social skills (Jacklin & Farr, 2005). The use of assistive technology has also enabled students with disabilities to overcome many of the barriers and obstacles they may face in their educational careers such as their ability to take notes and participate effectively in classroom activities. Krinic et al., (2013) assert that "*assistive technology (AT) can play a major role in overcoming the barriers that persons with developmental disorders have to face*" (p. 2).

While researchers have explored the important role technology can play in special education classrooms, very little has been done to explore teachers' perceptions regarding the use of technology with individuals diagnosed with autism. Understanding teachers' perceptions could be useful in determining the extent to which technological interventions are successful. Additionally, an examination of teachers' perceptions can aid in improving strategies or developing programs designed to increase teachers' comfort with a variety of technological tools to ensure the success of the educational experience for students with autism. The purpose of this study was to explore teachers' perceptions of the use of technology for students with autism, thus helping to bridge this gap in the literature. Broadly, the study asked the following questions: how do teachers' attitudes toward technology use affect their incorporation of technology in their teaching? What do teachers perceive as benefits from technology use for students diagnosed with autism?

## Review of the Literature

This literature review is focused on research related to the utility of technology incorporation in the classroom. Prior to that, autism will be defined, with attention to its prevalence and defining characteristics. Beginning with a definition helps contextualize the study and emphasizes its significance given the increasing number of individuals being diagnosed with autism. Research exploring the benefits of technology use, its role in improving students' focus, enhancing task completion, and improving the overall learning experience for the students will be reviewed.

### Autism: Definition, Prevalence and Characteristics

Autism spectrum disorder is one of the most common developmental disorders in the United States. The disorder is "is best conceptualized as a biologically determined set of behaviors that occur with varying presentation and severity which is likely the result of varying causes" (Goldstein, Nglier, Rzepa, & Williams, 2012, p. 1001). According to Zaroff and Uhm (2012), 86-91 out of every 10,000 individuals are diagnosed with autism in the United States. Laan, Ingram, and Glidden (2013) have reported statistics showing a large increase in the rates of cases of autism and report numbers from the Centers of Disease Control which show the number of individuals with autism has risen from "1 in 150 children in 2000 to 1 in 88 children in 2008" (p. 51).

Individuals with autism display different characteristics depending on the severity of their case. Webber and Scheuermann argue that those with a severe case of autism can experience "*communication and language deficits, cognitive disorders, social deficits, sensory processing deficits, and stereotyped behavior*" (p. 3). Symptoms are usually displayed after 3 years of age and can appear as early as 12 to 18 months of age (p. 3). Those challenged with language deficits tend to display a lack of motivation to communicate (p. 3). Language

difficulties impact cognitive development as well and as a result, individuals with autism are characterized as having “*here-and-now thinking*” (p. 2), meaning that unlike their peers, they find it challenging to deal with long-term planning.

### **Benefits of Technology**

The benefits of technology use for individuals with special needs have received much attention in the literature. Gentry (1991) defines instructional technology as “*the systematic application of strategies and techniques derived from behavior and physical sciences concepts and other knowledge to the solution of instructional problems*” (p. 7). This definition is broad enough to include all the varieties of technologies that instructors can use to enhance instructional experiences and facilitate learning. Gentry cautions it is important to pay attention to the “*message design, message delivery, and evaluation*” (p. 7). Therefore, the professional “*must internalize the idea that the selection of technology depends on both purpose and values. Some strategies and techniques are superior to others and should be chosen on that basis*” (Gentry, 1991, p. 8).

While some researchers have focused on defining the field of instructional technology and theorizing about the role of the educational expert, others have focused on the benefits associated with technology. Scholars have particularly emphasized the role technology plays in enhancing interaction in the classroom, increasing educational attainment, and comprehension. When studying classroom interaction, Jacklin and Farr (2005) found that learning through a “visual impact on what they are learning” with the use of technology to be the most effective in comparison to traditional methods. In measuring educational progress, findings showed that all students, regardless of gender, benefited from the use of projected aids such as “*computer progress slides, CD's, transparencies, multimedia, projectors and other technologies*” (Atta, Jamil, Ali, Ayaz, & Bashir, 2013). Furthermore, technology has been shown to enhance students’ comprehension in vocabulary retention. Findings reported by Lin and Tseng (2012) revealed annotated videos were useful for teaching new vocabulary through embedded annotations.

### **Focused Learning**

One of the most significant benefits of technology incorporation is that it aids in improving students’ focus in the classroom. For example, Moore and Calvert (2000) explored the use of computers in teaching vocabulary to individuals with autism. Comparing a behavioral program to a software program, the researchers sought to understand the positive influence of computers on teaching vocabulary. Fourteen children diagnosed with autism were randomly assigned to the study. They concluded the use of computers is not only cost-effective but also helps with “*children's attention, motivates them, and promote[s] their learning of vocabulary*” (p. 361). Studies also provide evidence that computer use enhanced students’ overall learning experiences and academic grades.

Yakubova and Doughty (2012) explored the value of a multicomponent intervention in helping students with autism and moderate intellectual disabilities to improve their skill acquisition using interactive whiteboards (IWB) or smart boards. Participants were assigned smart boards to watch video modeling clips and monitor their own performance using a self-monitoring strategy. Findings indicate that using smart boards/IWB with these participants demonstrated the utility of technological devices and their potential for increasing students’ skill acquisition and increasing students’ ability to interact with the materials to enhance their active participation in their own learning.

### **Technology and Assignment Completion**

Scholars have examined the important roles that iPads play in helping students with assignment completion. In their study, Flores, Musgrove, Renner, Hinton, Strozier, Franklin, and Hil (2012) argued that using iPads in classrooms not only helps improve students' communication skills but can improve their engagement with in-class assignments (p. 74). Participants in this study were in favor of using iPad technologies as compared to traditional tools which may partly explain the significant role it played in ensuring their engagement with the assigned tasks.

Aside from its role in increasing students' focus, and assignment completion, technology use has been found to improve the skills of those who work with students with challenging behaviors. Lowdermilk, Martinez, Pecina, Beccera, and Lowdermilk (2012) examined the use of educational games for providing "parents and caregivers with an opportunity to learn skills for behavior they want to see increase, and to use techniques to reduce rates of behavior they would like to see decrease [in students]" (p. 30). Using the intervention, *Behavior Breakthroughs*, a game designed to teach appropriate behavior management techniques to individuals who work with children with autism, researchers reported the potential of online educational games providing caregivers and teachers an opportunity "to hone their skills working with a digital child exhibiting challenging behavior without harming the actual child" (p. 34).

### **Using Technology to Improve Learning**

Hess, Morrier, Heflin, and Ivey (2008) surveyed "249 special education directors and autism consultants/specialists in 159 counties, representing all school districts in the State of Georgia" and explored different strategies in terms of technology incorporation in the classroom (p. 963). The study was useful in helping gain insight into strategies teachers implemented with their students. Findings indicated that less than 10% of the strategies used in the public schools in Georgia had scientific support for dealing with students diagnosed with autism (p. 962). In recent years, the potential of technology use in improving student learning has received much attention from scholars seeking to examine the impact of using technology to enhance the learning experience for individuals with autism.

Other scholars have examined the potential of using iPads in enhancing the learning experience by facilitating communication and motivating student engagement. The use of iPads specifically with students diagnosed with autism has also received some attention. In their study, Flores et al. (2010) compared the use of iPads in communication systems to ones that used pictures, such as PECS (p. 74). Findings indicated that while the results were mixed, students communicated more when using the iPad (p. 81). In a different study, Alves, Marques, Queiros, and Orvalho (2013) examined the use of LIFEisGAME, an iPad app, to determine its impact on the facial and emotional recognition skills of students with autism (p. 191). Their findings showed that "all participants enjoyed the prototype game and used the 15 minutes of play time" (p. 202). The iPad motivated students, and was "intuitive" for them "to start and navigate the game" (p. 203).

### **Method**

This study examined teachers' attitudes towards using technology with students diagnosed with autism. Seven teachers in two rural elementary schools in the Appalachian region of the United States participated in semi-structured interviews to explore their perceptions toward technology use, the different types of technology used in their classrooms, and the potential for these technological tools in improving student learning. The interviews were conducted in the schools where teachers worked full-time and were conducted over a period of a semester to due to scheduling issues related to school cancellations caused by winter weather.

## Participants

Seven special education teachers who teach students with disabilities at two elementary schools in the Appalachian region of the United States were recruited to participate in this study. To take part in this study, the participants were required to have had some experience teaching children identified with autism. All teachers were currently teaching students with autism except for one. The participants in this study were female teachers between the ages of 40 and 60 except for one teacher in her early 30s.

Demographic data indicates all participants had experience working with individuals with autism which ranged from three to 37 years. More than half the participants (five) had over 14 years of experience working with students with autism. Four participants had over 18 years of experience, and two had more than three years of experience. Participants also had a wide range of expertise in terms of the age ranges taught which ranged from infants to 12<sup>th</sup> grade. Six participants did not teach students above 6<sup>th</sup> grade. Six of the seven participants taught at least eight students with autism in their teaching career, and one participant taught three students. The participants were assigned numbers to ensure confidentiality and labeled P1 through P7. Demographic data can be found in Table 1.

**Table 1. Participants' Demographic Data**

Participant	P1	P2	P3	P4	P5	P6	P7
Teaching grades	K to 6	3 <sup>rd</sup> to 6 <sup>th</sup>	Infant to PK	K to 12 <sup>th</sup>	K to 6	PK to 6 <sup>th</sup>	K to 2 <sup>nd</sup>
Years of Experience	18	14	34	37	19	3	3
Students with Autism	8	9	20	15	8	3	20
Use of technology	Against	In favor	In favor	In favor	In favor	In favor	In favor

## Instruments

Semi-structured interviews were used as the method of data collection for this study. This method was chosen because it allows the researcher flexibility to begin with a standard set of questions, then probe for additional information during the interview if the researcher determines it is relevant. The participants were asked about their views regarding their experience teaching students with autism, their views regarding technology use, the specific types of technologies they employ in their classrooms, and their views regarding its benefits and utility for learning.

## Procedures

Permission was first obtained from the university's Internal Review Board (IRB) for the use of human subjects and permission to contact teachers was gained from school district administrators. After administration permission was granted, the researcher personally went to each of the schools to explain the study and invite potential participants to take part in this research project. The individual interviews took place at the schools where the participants worked and lasted between 15 to 20 minutes. An audio recorder was used to ensure participants' responses were accurately captured. At the end of each interview, the researcher carefully transcribed the interview while the information was still fresh.

## Data Analysis

After the interviews were recorded and transcribed, they were read repeatedly. The researcher began the coding process to determine common themes among the responses. The researcher relied on close-in and far-out comparison looking at "*opposite or extremes to bring out significant properties*" (Strauss & Corbin, 1998, p. 94). The researcher utilized thematic analysis to highlight important concepts that emerged, which helped in the search for broader categories that encompassed the different concepts. After similarities were established between the concepts, the researcher divided participant responses into broader categories under which the themes fell. These categories included: teacher's attitudes towards technology use, benefits of using technology, and technology's roles in students' independence. Using thematic analysis, the researcher was able to identify common threads and determine the similarities and differences in participants' perceptions towards the use of technology with students diagnosed with autism.

## Results

This study's findings revealed an overall positive attitude towards technology use, with six of the seven participants indicating they utilize high tech technologies in their classrooms. The findings are divided into three different themes: teachers' attitudes towards using technology, perceived benefits of incorporating technology in classrooms, and the different skills technology helps students to develop.

### Types of Technology

Six of seven participants used technology in the classroom: one declared that she never uses the computer in her classroom. Instructors also reported using a variety of technological tools which included computers, iPads, visual timers, smart boards, flashcards, and apps. Six of the instructors used computers, and four used iPads. Five used smart boards, while four used flashcards/pictures. Three participants reported using educational games, and two reported the use of visual timers. Two stated they use apps. P1 was consistent with her views reporting that she only used books in her classroom.

Two participants recommended the use of apps, and two others encouraged the use of smart boards. Three recommended the use of computers, and three recommended the use of iPads. Four instructors recommended the use of flashcards, and four recommended the use of pictures, while one recommended the use of a communication device.

### Benefits of Technology

**Focus on task.** Focus on task is one of the most important benefits teachers reported of technology use in the classroom. Focusing on a task is often a challenge for individuals with autism because it requires spending time on a given task without being easily distracted. Participants highlighted the importance of using technology to help with student focus to enhance task completion and indicated that technology benefits in its ability to accommodate different learning preferences. Participants also pointed out that technology helps motivate students by encouraging engagement and focus on tasks. Related to this category is the fact that technology is interesting to children and attracts their attention, which aids in task completion. Technology also provides alternatives for engaging with the task, which facilitates task completion. In terms of helping students focus on tasks, one participant indicated that technology can function as "a reward system" that can be useful in helping students focus on the task in anticipation of a reward.

**Assignment completion.** The respondents expressed positive views regarding the use of technology to impact student learning. Two instructors spoke of the role technology can play

in providing students with alternative tools to express themselves and answer the question, supporting active participation in the classroom. As one the respondent put it, students do not need to "verbalize" their answers. They can simply use pictures or click and point techniques to answer questions. In terms of helping with task completion, one participant highlighted the important role that technology can play by encouraging "students to start/stop assignments, to obtain better behavior, study, habits, and skills" through its function as a "reward system."

Convenience was also a category that emerged. Three respondents praised technology for its accessibility, how it facilitates assessment, and encourages independence. Technology's accessibility and utility was made clear by one participant who labeled it the "new backpack" implying its convenience and mobility. Another pointed out the importance and utility of using technology to engage parents' in the child's learning experience. For example, technology in the form of email, is used to send extra materials to parents to help with the child's homework. Another category that emerged is the ability of technological tools to ensure better quality work.

**Impact on student learning.** The respondents also held positive views regarding the use of technology to impact student learning. Different categories emerged from instructors' responses. Two instructors spoke of the role technology can play in providing students with alternative tools to express themselves and answer questions by simply using pictures or clicking and pointing techniques to answer questions.

It became clear from the instructors' responses that technology positively influenced student self-expression which manifests itself in improved writing and communication skills. Two respondents highlighted the importance of technology in improving students' writing abilities, and one respondent pointed out its importance in improving communication in general.

Another category that emerged was students' motivation. Technology, as pointed out by three of the participants, increases students' engagement and focus. Two respondents reported using technology leads to boosting students' motivation while one respondent highlighted the importance of using technology to help them focus.

The use of technology was also reported to facilitate student learning. For example, using technology was described as having an impact on students' comprehension, understanding, and participation in classroom activities. Technology was found to help improve students' learning skills such as note taking and keyboarding. Respondents also pointed out the importance of using technology to help accommodate students' learning preferences. One instructor described the benefits of technology to help address those with visual learning preferences.

## **Discussion**

This study examined teachers' attitudes toward using technology with students diagnosed with autism. The findings suggest that technology has a positive impact on students' focus on task, assignment completion, and increased learning. Findings further suggest that using technology positively influences students' ability to focus on their writing and reading skills. In this study, focused-learning in the classroom environment meant focusing students' attention on the subject matter. Findings also suggest that technology makes it easier for students to finish their tasks in a timely manner and independently. Moreover, it makes it easier for the teacher to provide useful and timely feedback.

In this study, assignment completion referred to finishing assignments and classroom activities. This study found teachers perceived technology incorporation to be beneficial for those with autism. Technology provides students with alternative ways of completing tasks; for example, using smart boards as an alternative for worksheets actively engage students to enhance assignment completion. Technological tools not only are flexible and accessible to

use, but also offer different learning methods that motivate students to enhance efficiency. This study found that technology is useful in terms of facilitating task completion and increased engagement.

Increased learning, in this study, was coupled with the two previous findings: focus on task and assignment completion. This study found that once students focused on their task and finished their assignments in a timely manner using technology, their learning improved. For example, one participant explained that after utilizing different technology in the classroom, she witnessed many changes in students' learning skills. She indicated that using technology not only improved students' writing and reading skills, but also improved their comprehension levels and participation in the classroom.

These findings are consistent and support earlier findings regarding the role technology plays in impacting task completion. The role technology plays in improving students' motivation was established by Xin and Sutman (2011) who used smart boards to implement social stories to motivate students. Moore and Calvert (2000) also found that using computer technologies with students with autism is not only cost-effective, but also motivates them to learn.

### **Conclusion**

The purpose of this study was to examine teachers' attitudes towards technology use. Through the use of semi-structured interviews, the researcher collected data from seven participants. The respondents reported positive views regarding the use of technology to impact student learning. Three themes emerged from instructors' responses which included: assignment completion, focus on task, and positively impacting the overall learning experience of the students.

One of the implications of these findings is that school administration needs to ensure teachers are provided with the tools and training they need to achieve the desired outcomes with the incorporation of technology in the classroom. As new technologies appear, administrators may want to ensure teachers are provided with the opportunity to receive training on how to use these new tools to facilitate their integration into the school curricula. Because of the ability of technological tools to engage students and provide alternative methods for learning and self-expression, students with special needs can benefit greatly from them. Technology allows students to respond to questions without the need to verbalize their answers, which is useful for those who experience difficulty with communication. The benefits of technology ought to be further explored to ensure that students are able to participate and actively take part in the lesson.

Although the current study provides useful insights into teachers' perceptions towards the use of technology, there are some limitations. A bigger sample size would have provided better insights into the different tools used by special education teachers. Because teachers in the study came from only two schools in one district, it would have been useful to interview instructors from more schools across districts to determine the range of technology tools used. Differences across grade levels would also be useful to determine if the type of technology use differs by age of the students.

Future research should examine the different factors that influence teachers' choice of technology with a larger sample. Interviewing parents may also be useful to determine parents' perceptions of the impact of technology on their children's learning experiences. Although instructors use a variety of technological tools, it would be useful to determine what factors influence their choices by exploring the pedagogical basis for teachers' technology choices . Although the data revealed teachers had positive perceptions regarding technology use in the classroom for students with autism, future research should focus on analyzing factors that influence teachers to use specific technological tools over others.

**References:**

- Almakhalfi, G., & Tibi, S. (2012). The use of assistive technology for people with special needs in UAE. *Journal of International Special Needs Education*, 15(1), 56-71.
- Alves, S., Marques, A., Queiros, C., & Orvalho, V. (2013). LIFEisGAME prototype: A serious game about emotions for children with Autism Spectrum Disorders. *PsychoNology Journal*, 11(3), 191-211.
- Atta, M., Jamil, A., Ali, U., Ayaz, M., & Bashir, S. (2013). Comparative effectiveness of instructional technology regarding educational attainment of students at elementary level. *Gomal University Journal of Research*, 29, 49-55.
- Fan, T. (2012). Enhancing learning with the use of assistive technology for children on the autism spectrum. *Online Submission*.
- Flores, M., Musgrove, K., Renner, S., Hinton, V., Strozier, S., Franklin, S., & Hil, D. (2012). Comparison of communication using the Apple iPad and picture-based system. *Augmentative and Alternative Communication*, 28(2), 74-84.
- Gray, C., & Gerard, J (1993). Social stories: Improving responses of students with autism with accurate social information. *Focus on Autistic Behavior*, 8, 1-10.
- Gentry, C. (1991). Educational technology: A question of meaning. In G. Anglin (Ed.), *Instructional technology* (pp. 1-10). Colorado: Libraries Unlimited.
- Goldstein, S., Naglieri, J., Rzepa, S., & William, K. (2012). A national study of autistic symptoms in the general population of school-age children and those diagnosed with autism spectrum disorders. *Psychology in the Schools*, 49(10), 1001-1017.
- Hess, K., Morrier, M., Heflin, L., & Ivey, M. (2008). Autism treatment survey: Services received by child with autism spectrum disorders in public school classrooms. *Journal of Autism and Developmental Disorders*, 38, 961-971.
- Jacklin, A., & Far, W. (2005). The computer in the classroom: A medium for enhancing social interaction with your people with autistic spectrum disorders? *British Journal of Special Education*, 34(4), 202-211.
- Kilham, C. (2009). Online wiki collaboration by teachers of students with autism spectrum disorders. *Australian Journal of Special Education*, 33(2), 117-129.
- Kirinic, V. V., Vidacek-Hains, V. V., & Kovacic, A. A. (2010). Computers in education of children with intellectual and related developmental disorders. *International Journal of Emerging Technologies in Learning*, 2, 12-16. doi:103991/ijet.v5s2.1246.
- Laan, J., Ingram, R., & Glidden, M. (2013). Law enforcement training on mental disorders and autism spectrum disorders in the Southeastern United States. *Journal of Global Intelligence and Policy*, 6(10), 51-67.
- Lin, C., & Tseng, Y. (2012). Video and animations for vocabulary learning: A study on difficult words. *The Turkish Online Journal of Educational Technology*, 11(4), 346-356.
- Lowder, J., Martinez, D., Pecina, J., Beccera, L., & Lowdermilk, C. (2012). Behavior breakthroughs: Future teachers reflect on a focused game designed to teach ABA techniques. *TechTrends*, 56(3), 29-36.
- Machalicek, W., Rspoli, M., Lang, R., O'Reilly, M., Davis, T., Franco, J., & Chan, J. (2010). Training teacher to assess the challenging behaviors of students with autism using video tele-conferencing. *Education and Training in Autism and Developmental Disabilities*, 45(2), 213-215.
- Moore, M., & Calvert, S. (2000). Brief report: Vocabulary acquisition for children with autism: Teacher and computer instruction. *Journal of Autism and Developmental Disorders*, 30(4), 359-362.

- More, C. (2008). Digital stories targeting social skills for children with disabilities: Multidimensional learning. *Hammil Institute on Disabilities*, 43(3), 168-177.
- Nepo, K. (2010). The use of technology to improve staff performance. *International Journal of Behavioral Consultation & Therapy*, 6(2), 134-142.
- Sror, J. (2012). Show me! Enhanced feedback through screening technology. *TESL*, 30(1), 104-116.
- Strauss, A., & Corbin, J. (1998). *Basics of qualitative research: Techniques and procedures for developing grounded theory*. California: Sage Publications.
- Webber, J., & Scheuermann, B. (2008). *Educating students with autism: A quick start manual*. Texas: Pro. Ed.
- Wu, Y. T., Hou, H. T., Hwang, F. K., Lee, M. H., Lai, C. H., Chiou, G. L., Lee, S. W. Y., Hsu, Y. C., Liang, J. C., & Chen, N. S. (2013). A review of intervention studies on technology assisted instruction from 2005-2010. *Educational Technology & Society*, 16(3), 191-203.
- Xin, J., & Sutman, F. (2011). Using the smart board in teaching social stories to students with autism. *Teaching Exceptional Children*, 43(4), 18-25.
- Zaroff, C., & Uhm, S. (2012). Prevalence of autism spectrum disorders and influence of country of measurement and ethnicity. *Social Psychiatry Psychiatric Epidemiology*, 47, 365-398. doi: 10.1007/s00127-011-0350-3

# **The Motor Skills of Adolescents with Hearing Impairment in a Regular Physical Education Environment**

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## **Abstract**

*With the exception of balance, adolescents with and without hearing impairment (HI) could have similar motor skills. However, the motor proficiency traits in this age group have not been clearly defined under the same integrated Physical Education (PE) environment. This study compared the gross and fine motor skills of twenty four female adolescents (HI group: n = 7; Hearing group: n = 17; age range: 13 – 15 years) in a regular school. Non-significant difference was found in overall gross and fine motor skills ( $p > .05$ ). However, the HI group scored significantly poorer in kinaesthetic integration than the Hearing group ( $p \leq .05$ ). The findings of this study imply poorer balance abilities of adolescents with HI when compared to their hearing peers. Therefore, structured individualised physical activities focusing on balance development in addition to their regular PE lessons are proposed to improve their balance proficiency for better inclusivity.*

**Keywords:** disability, inclusive education, special education

## **Introduction**

Hearing Impairment (HI), also known as hearing loss, refers to the inability to hear normally (Daniel & Lim, 2012). Inevitably, HI has the potential to affect speech and language development due to the challenges associated with receiving and processing auditory information (REF). HI is considered as one of the prevalent congenital disabilities and/or birth defects in Singapore with about 3.7 per 1,000 newborns are diagnosed with HI (Daniel & Lim, 2012). Among those diagnosed with HI, about 1.7 per 1,000 had significant hearing loss (severe – profound; Low, Pang, Ho, Lim, & Joseph, 2005). Without early identification and intervention, these children with HI are at risk of delay in speech and language, intellectual, academic, social and emotional development (Low, 2005; Low et al., 2005).

Studies have reported delayed motor development or poor motor proficiency traits of children and adolescents with HI (Engel-Yeger & Weissman, 2009; Hartman, Houwen & Visscher, 2011; Schlumberger, Narbona, & Manrique, 2004). With the exception of balance, studies have shown that children and adolescents with HI could have similar motor performance for selected motor skills as their hearing peers (Butterfield, 1986, 1987; Brunt & Broadhead, 1982; Dummer, Haubenstricker, & Stewart, 1996).

Stemming from an ecological perspective, Newell's constraints model (1986) could provide an explanation for the motor skill performance of children with HI. Newell (1986) describes how the interaction of individual (e.g. HI), environmental (e.g. physical activity) and task (e.g. one-leg balance) constraints could reciprocally interact with one another to influence psychomotor skills. Delayed psychomotor development as a result of deprived sensory information could be explained by individual constraints such as co-occurring vestibular defects (Schmidt, 1985; Weiss & Phillips, 2006; Wiegersma & Van der Velde, 1983) and/or auditory defects (Hartman et al., 2011; Horak & Macpherson, 1995). Hearing loss is frequently associated with the dysfunction of the vestibular system. This dysfunction of the vestibular system has implications leading to poor balance abilities which could lead to coordination problems and abnormalities in postural control (Horak, Shumway-Cook, Crowe, & Black, 1988; Suarez, Angeli, Suarez, Rosales, Carrera, & Alonso, 2007). This is further supported by Crowe and Horak (1988) who suggested the strong possibility of co-occurrence between vestibular dysfunction (balance) when the auditory (cochlear) mechanism is impaired. Further investigation of the literature suggests that children and adolescents with HI tend to score lower than their hearing peers and/or normative sample on motor test items which require good control of balance (Boyd, 1967; Engel-Yeger, Golz, & Parush, 2004; Livingstone & McPhillips, 2011).

In relation to environmental constraints, studies have shown that a deprived environment may lead to poor physical fitness and less developed motor skills of children and adolescents with HI (Lieberman, Volding, & Winnick, 2004; Polat, 2003). For example, studies have linked poor physical fitness of children and adolescents with HI to obesity and sedentary lifestyles (Dair, Ellis, & Lieberman, 2006; Ellis, Lieberman, Fittipauldi-Wert, & Dummer, 2005; Stewart & Ellis, 2005; Zaccagnini, 2005). Environmental constraints include unstructured Physical Education (PE) curriculum, inadequate instruction time and limited physical activity opportunities rather than individual constraints associated with HI (Butterfield, 1991; Dummer et al., 1996; Gheysen, Loots, & Van Waelvelde, 2008).

The No Child Left Behind Act (Act, 2001) has triggered an increasing worldwide attention and provisions for children with disabilities, including those with HI. Singapore had launched the ComCare Fund to ensure that 'no Singaporean is left behind' (MSF, 2005). Since then, inclusive education has been growing its acceptance in Singapore. The process of integrating or including children with disabilities into Singapore regular schools has continued to receive legislative support. Children and adolescents with HI could either study in special schools for HI or in regular schools. Ho (2007) wrote that the majority of the children with HI could be successfully integrated or included into regular classrooms within the same educational framework as their hearing peers. The integration or inclusion of children and adolescents with HI within regular schools is also higher than other sensory disabilities. It was reported that 502 children with HI compared with 61 children with visual impairment were studying in regular schools (Ministry of Education [MOE], 2002). Although the current statistics are not available, a recent comparison showed a decrease in the number

of children with hearing and visual impairments in special schools (Year 2000: 9% of 4,000 students; Year 2010: 3% of 4,800 students; MOE, 2011).

According to Armstrong, Armstrong and Spandagou (2011), inclusive education is epitomised as the ‘Education for All’. In Singapore, the PE vision is “Every Child is Physically Educated” and the PE mission is to develop a curriculum to meet the needs of the nation, community and individual (MOE, 2006). This seems to align with the notion of inclusive education. As more children and adolescents with HI are integrated or included in regular classrooms, the understanding of their motor proficiency traits becomes increasingly necessary for PE planning. The guideline for PE lessons in secondary schools is for all students without medical exclusion to have two 40-minute periods per week, accumulated to at least 29 weeks of two periods per year (MOE, 2006). Within the year, the key PE components include educational gymnastics, dance, games, health and fitness management, track and field and lastly, swimming. While there are international studies investigating the motor or physical domains of children and adolescents with HI (Butterfield, 1987; Dair et al., 2006; Dummer et al., 1996; Gheysen et al., 2008; Horak et al., 1988), comparative information with their hearing peers within the same regular PE setting is limited (Tan, Nonis, & Chow, 2011). Therefore, the aim of this study is to examine the motor skills of adolescents with HI in comparison with their hearing peers who attended similar PE lessons within a regular school.

## Method

### Participants

Twenty-four female adolescents with and without hearing impairment (age range: 13 – 15 years; HI group:  $n = 7$ ;  $M$  age =  $14.71 \pm 1.11$  years; Hearing group:  $n = 17$ ;  $M$  age =  $13.53 \pm 0.72$  years) were recruited for this study. A secondary school with HI-enabled facilities was identified for recruiting participants with and without HI within the same regular educational environment. The discrepancy in the sample size of HI group and Hearing group is a realistic representation of the HI population in the HI-enabled secondary school. It was reflective of the low incident rate of children with significant hearing loss in Singapore (Low et al., 2005). Voluntary child assents and informed parental consents were obtained together with IRB approval. A health and fitness declaration reply form was completed by every participant to understand their health and medical conditions. Only participants without pre-existing health conditions, recent injury problems and/or motor impairment were included. The HI group had sensorineural hearing loss, ranging from severe to profound ( $> 70$  dB) within the last 12 months of clinical diagnosis prior to the time of testing. The Natural Auditory Oral Approach (NAO) with assistive hearing aids and without sign language was used to communicate with the HI group. All participants attended similar Physical Education (PE) lessons under an integrated setting without additional support given to the HI group. Non-significant differences in the physical activity intensity levels between adolescents with and without HI were reported ( $p > .05$ ).

### Instrument and Tasks

The McCarron Assessment of Neuromuscular Development (MAND) was used in this study (McCarron, 1997). It consists of five fine motor tasks (FM: Bead in Box, Beads on Rod, Finger Tapping, Nut and Bolt & Rod Slide) and five gross motor tasks (GM: Hand Strength, Finger-Nose-Finger, Jumping, Heel-Toe Walk & Standing on One Foot). These are to determine the 1) Neuromuscular Development Index (NDI), 2) Kinaesthetic Integration (KI: Heel-Toe Walk & Standing on One Foot), 3) Muscular Power (MP: Hand Strength &

Jumping), 4) Persistent control (PC: Rod Slide & Finger-Nose-Finger) and 5) Bimanual Dexterity (BD: Beads on Rod & Nut and Bolt). The NDI results refer to the combined factor scores of fine and gross motor skills (FM & GM) which has been used to screen for signs of motor impairments based on the overall proficiency of neuromuscular development of the participants of different countries (Hands, Larkin, & Rose, 2013; McCarron, 1997). The KI results are the combined factor scores of the tasks of “standing on one foot” (SOF) and “heel-toe walking” (HTW) which requires static and dynamic balance abilities respectively. Participants took between 20 to 30 minutes to complete each test session.

### **Test Procedures and Instructions**

Familiarisation sessions were carried out prior to testing. The tests were conducted at a safe indoor environment within the participants’ school compound. Standardised verbal instructions and visual demonstrations were provided in accordance to MAND test guidelines. Testing was administered in the same sequence – Bead in Box, Beads on Rod, Finger Tapping, Nut and Bolt, Rod Slide, Hand Strength, Finger-Nose-Finger, Jumping, Heel-Toe Walk and Standing on One Foot as recommended in the manual (McCarron, 1997).

### **MAND Training for Tester**

Prior to the data collection, one tester was trained with reference to the MAND test guidelines (McCarron, 1997). Five out of the 10 MAND tasks involve a combination of qualitative observations and quantitative measurements using the MAND protocol scoring sheet. Administering these five process-oriented tasks thus would require test-retest reliability check. The tester met the recommended MAND test-retest reliability for four of these process-oriented tasks (rod slide:  $r = 0.95$ , finger-nose-finger:  $r = 0.88$ , jumping:  $r = 0.99$  & heel-toe-walk:  $r = 0.94$ ), with the exception of finger tapping ( $r = 0.91$ ). Nonetheless according to the general reliability coefficient guidelines, reliability coefficients of 0.90 or more were interpreted as excellent test-retest reliability.

### **Data Reduction and Analysis**

The raw scores of the 10 MAND tasks were recorded and scaled scores were computed for respective tasks. Subsequently, these scores were changed into the NDI, FM, GM, KI, MP, PC and BD factor scores according to the age appropriate MAND norm tables (McCarron, 1997). A scale score of  $\geq 7$  and a factor score of  $\geq 85$  would be denoted as within the norm range. The dependent variables of MAND Tasks were tested for the assumptions of parametric tests using the Test of Normality and Levene’s Test for Equality of Variance. The hypotheses for normal distribution and homogeneity of variances in both tests were rejected ( $p > .05$ ). This indicated that the assumptions of normalised distributed data were not fulfilled and thus the non-parametric Mann-Whitney test was used to test for significant differences in the MAND results between HI group ( $n = 7$ ) and Hearing group ( $n = 17$ ) at  $p \leq .05$ .

## **Results**

### **Group analysis of the Neuromuscular Development Index (NDI), Fine Motor (FM) and Gross Motor (GM) results**

The results of this study showed that, with the exception of one participant with HI whose NDI was below-norm range (norm  $\geq 85$ ), all participants with HI had within-norm NDI results. Statistical analysis using Mann-Whitney test further showed non-significant NDI difference between HI group and Hearing group ( $p > .05$ ; see Table 1). Non-significant differences were shown in NDI, FM and GM results between HI group and Hearing group (NDI:  $Z = 0.000$ ,  $p = 1.000$ , FM:  $Z = 0.000$ ,  $p = 1.000$ , GM:  $Z = -1.334$ ,  $p = .182$ ; see Table 1).

**Table 1. NDI, FM and GM Factor Scores Group Results of HI group & Hearing group**

FS	Group	n	Mean	SD	Z-score	effect size	p
NDI	HI	7	88.3	15.1	0.000	0.000	1.000
	Hearing	17	87.1	17.2			
Fine Motor [FM]	HI	7	94.9	8.6	0.000	0.000	1.000
	Hearing	17	92.6	17.0			
Gross Motor [GM]	HI	7	79.3	13.2	-1.334	0.272	.182
	Hearing	17	82.9	12.7			

Note. p-values calculated from Mann-Whitney test for significance differences between HI group and Hearing group at  $p \leq .05$ .

### Group analysis of the Muscular Power (MP), Persistent Control (PC) & Bimanual Dexterity (BD) results

Similarly, non-significant MP, PC and BD differences were also observed between HI group and Hearing group using the Mann-Whitney test (MP:  $Z = -0.889$ ,  $p = .374$ , PC:  $Z = -0.159$ ,  $p = .874$ , BD:  $Z = -1.524$ ,  $p = .127$ ; see Table 2).

**Table 2. MP, PC & BD Factor Scores Group Results of HI group & Hearing group**

FS	Grp	n	Mean	SD	Z-score	effect size	p
Muscular Power [MP]	HI	7	85.7	20.3	-0.889	0.181	.374
	Hearing	17	78.2	19.2			
Persistent Control [PC]	HI	7	67.9	21.8	-0.159	0.032	.874
	Hearing	17	66.8	21.4			
Bimanual Dexterity [BD]	HI	7	117.1	11.1	-1.524	0.311	.127
	Hearing	17	103.2	22.2			

Note. p-values calculated from Mann-Whitney test for significance differences between HI group and Hearing group at  $p \leq .05$ .

### Group analysis and intra-individual analysis of the Kinaesthetic Integration (KI) results

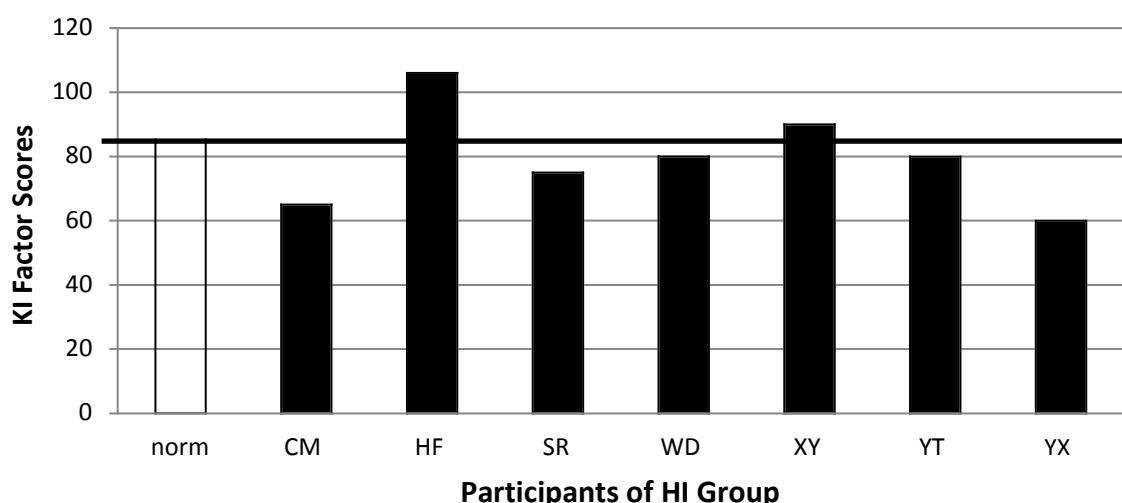
In this section, both group and individual KI results of HI group and Hearing group are reported. In contrast to the non-significant NDI, GM, FM, MP, PC and BD group results, the Mann-Whitney test reported significantly poorer KI result ( $p < .05$ ; see Table 3). Specifically, lower factor scores with moderate effect size were observed in the HI group as compared to the Hearing group (HI group:  $M = 78.6$ ,  $SD = 13.8$ ; Hearing group:  $M = 95.6$ ,  $SD = 14.5$   $Z = -2.350$ ,  $p = .019$ ; see Table 3).

**Table 3. KI Factor Scores Group Results of HI group & Hearing group**

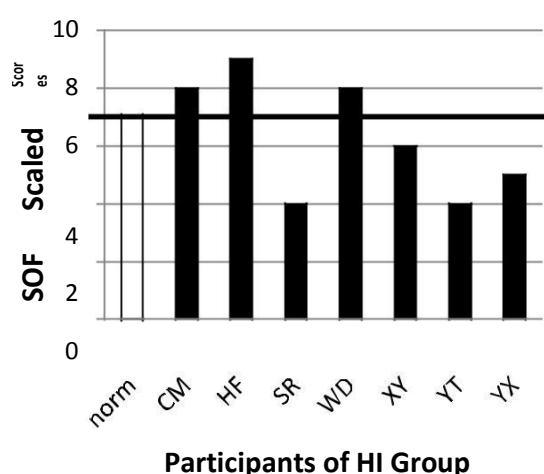
FS	Grp	n	Mean	SD	Z-score	effect size	p
Kinaesthetic Integration [KI]	HI	7	78.6	13.8	-2.350	0.480	.019*
	Hearing	17	95.6	14.5			

Note. p-values calculated from Mann-Whitney test for significance differences between HI group and Hearing group at  $p \leq .05$ .

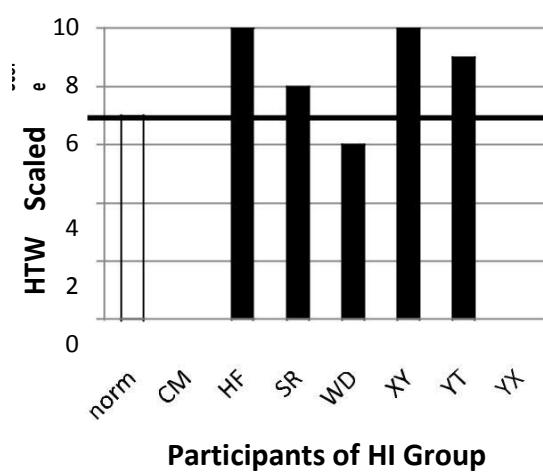
The KI results showed that, with the exception of Participant HF and Participant XY, all participants with HI displayed KI factor scores that were below-norm range compared with the MAND normative sample (norm  $\geq$  85; see Figure 1). The individual analysis of the two balance tasks which compute the KI results revealed more information regarding the balance abilities of the HI group. Specifically, the group mean scaled scores indicated that the HI group exhibited mild difficulties (norm  $\geq$  7) in the static balance task of “standing on one foot: SOF” (static balance;  $M = 6.29$ ,  $SD = 2.06$ ) and the dynamic balance task of “heel-toe walking: HTW” (dynamic balance;  $M = 6.14$ ,  $SD = 4.41$ ). Closer inspection of the individual scaled scores revealed that the percentages of participants with HI who displayed scaled scores within norm range for the tasks of SOF and HTW were 42.9% (3 out of 7) and 57.1% (4 out of 7) respectively (see Figure 2 & 3).



**Figure 1. The KI Factor Scores Individual Results (including Standing on One Foot & Heel-Toe Walking).**



**Figure 2. The Standing on One Foot Scaled Scores Individual Results.**



**Figure 3. The Heel-To-Walk Scaled Scores Individual Results.**

## **Discussion**

### **The Neuromuscular Development of Adolescents with HI**

The non-significant NDI difference ( $p > .05$ ; see Table 1) between adolescents with HI and their hearing peers in this study has corroborated with most studies investigating on children and adolescents with HI (Engel-Yeger & Weissman, 2009; Gheysen et al., 2008; Schlumberger et al., 2004). To date, using the MAND to compare the motor skills of children and adolescents with HI has not been documented. By comparison, many studies investigating the motor proficiency traits and balance abilities of children and adolescents with HI using other battery tests have been reported (Butterfield, 1986, 1987; Dummer, Haubenstricker, & Stewart, 1996; Engel-Yeger, Golz, & Parush, 2004; Engel-Yeger & Weissman, 2009; Gheysen, Loots, & Van Waelvelde, 2008; Hartman, Houwen, & Visscher, 2011; Lieberman, Volding, & Winnick, 2004; Livingstone & McPhillips, 2011). While Wiegersma and Van der Velde (1983) considered the possibility of HI as the product of neurological defects in their study, none of these studies reported that poorer motor proficiency could be linked to neuromuscular defects (Engel-Yeger et al., 2004; Engel-Yeger & Weissman, 2009; Gheysen et al., 2008; Hartman et al., 2011; Livingstone & McPhillips, 2011).

### **The Gross Motor Performance of Adolescents with HI**

Numerous studies have investigated the gross motor performance of children and adolescents with HI (Boyd, 1967; Brunt & Broadhead, 1982; Butterfield, 1987; Dummer et al., 1996; Lieberman et al., 2004; Lindsey & O'Neal, 1976; Wiegersma & Van der Velde, 1983). Based on the non-significant GM results in this study ( $p > .05$ ; see Table 1), it is suggested that the gross motor skills performance of the adolescents with HI are not significantly different from their hearing peers. Closer examination of most studies revealed that the children and adolescents with HI scored lower than their hearing peers and/or normative sample on motor test items which require good control of balance (Boyd, 1967; Engel-Yeger et al., 2004; Livingstone & McPhillips, 2011). Some of these gross motor tests included balance test items such as balance on one foot (Brunt & Broadhead, 1982), heel-toe walking or walking on a balance beam (Butterfield, 1986, 1987; Butterfield & Ersing, 1986). Nonetheless, the non-significant GM difference in this study was supported by some other studies which reported comparable gross motor skills between HI and their hearing peers (Brunt & Broadhead, 1982; Butterfield, 1986, 1987; Dummer et al., 1996).

Further analysis of the non-significant GM results pointed out that both HI group and Hearing group showed a group mean of below-norm range (norm  $\geq 85$ ; see Table 1). In addition, a larger percentage of participants with HI were found to perform at a below-norm range for KI tasks. The GM results are the combined factor scores of gross motor tasks (KI tasks, MP tasks & "finger-nose-finger"). This would suggest that the gross motor proficiency of the participants with HI at below-norm range is more likely to be associated with the significantly poorer KI results compared with their hearing peers. The findings in the current study lend support to other studies which reported that participants with HI scored poorer on motor test items requiring good control of balance (Boyd, 1967; Engel-Yeger et al., 2004; Livingstone & McPhillips, 2011). The findings of this study imply that balance control is critical to the performance of gross motor tasks such as standing on one foot and heel toe walking in the MAND test. These would further suggest that toe walking and balancing on one foot task could be included in their movement programmes to enhance their balance control. However, this plan would have to be investigated further in another research study.

The non-significant GM comparison between HI group and Hearing group in this study suggested that HI as an individual constraint may not be a strong influence on their gross motor skills. Studies have shown that environmental factors such as parenting styles, schooling environment and social perceptions could influence the development of motor skills and proficiencies of motor abilities of children and adolescents with HI (Dummer et al., 1996; Lieberman et al., 2004; Wiegersma & Van der Velde, 1983). However, the findings of this study reported non-significant GM differences as well as non-significant FM, MP, PC and BD results ( $p > .05$ ; see Tables 1 & 2) between adolescents with HI and their hearing peers. This would suggest that the presence of different environmental constraints between them, if any, may not be strong to elicit significant differences. Instead, it could be explained by the fact that both adolescents with HI and their hearing peers were studying in the same regular school and attended similar Physical Education (PE) lessons. Therefore, with the non-significant GM differences between adolescents with HI and their hearing peers ( $p > .05$ ; see Table 1), it could be concluded that neither HI as the individual constraint nor education setting as the environmental constraint pose any significant impact to the gross motor performance of these adolescents with HI in this study.

### **The Balance Abilities of Adolescents with HI**

The HI group had significantly lower KI factor scores than the Hearing group which was also an indication of poorer balance ( $p \leq .05$ ; see Table 3). This finding is supported by many studies which reported that the children and adolescents with HI demonstrated poorer balance abilities when compared to their hearing peers (Boyd, 1967; Engel-Yeger et al., 2004; Engel-Yeger & Weissman, 2009; Schlumberger, Narbona, & Manrique, 2004; Tan, Nonis, & Chow, 2011; Wiegersma & Van der Velde, 1983). Further, this finding is supported in other studies that have reported similar poorer balance abilities in the HI population compared with the normative sample (Brunt & Broadhead, 1982; Hartman et al., 2011; Livingstone & McPhillips, 2011).

While it was suggested that the HI group scored poorer in balance performance than their peers from their significant mean differences, the intra-individual analysis of the KI results were not consistently true that all HI participants had poor balance control. Two out of seven participants scored KI factor scores of within norm range (see Figure 1). Nonetheless, the HI group showed a group mean of below-norm range whereas the Hearing group showed a group mean of norm range respectively (norm  $\geq 85$ ; see Table 2). Specifically, intra-individual analysis of each participant with HI revealed that with the exception of Participant HF and Participant XY, 71.4% (5 out of 7) of the participants with HI displayed KI factor scores of below-norm range. This finding suggests that five participants with HI demonstrated poorer balance abilities than the MAND normative sample (see Figure 1).

From the group mean scaled scores, the HI group exhibited mild difficulty (below-norm range) for the static balance task of “standing on one foot”. In particular, 57.1% of the participants with HI displayed individual scaled scores of below-norm range for “standing on one foot” (see Figure 2). The implication of these findings is that most participants with HI in this study had poorer static balance than the MAND normative sample. This concurs with studies reporting similar poorer proficiency in the ability to balance on one leg when the children and adolescents with HI were compared to their hearing peers (Boyd, 1967; Engel-Yeger et al., 2004). In the dynamic balance task of “heel-toe walking”, fewer participants with HI (42.9%; see Figure 3) displayed individual scaled scores of below-norm range. However, similarly, the group mean scaled scores of the HI group were still indicative as having mild difficulty for “heel-toe walking”. Many studies also reported poor dynamic

balance, coordination and/or reaction time in children and adolescents with HI (Brunt & Broadhead, 1982; Butterfield, 1986; Wiegersma & Van der Velde, 1983).

The group and individual analysis of the KI results showed that the adolescents with HI demonstrated poorer balance than their hearing peers and/or the MAND normative sample. The poorer KI performance of the adolescents with HI observed in this study corroborates with the widely-discussed literature which reported poor balance in the children and adolescents with HI (Engel-Yeger et al. 2004; Hartman et al., 2011; Livingstone & McPhillips, 2011). Based on the findings in this study, this could be due to the poorer static and dynamic balance abilities of the adolescents with HI than their hearing peers.

Using Newell's (1986) constraints model to understand the dynamic nature of individual, task and environmental constraints of the participants with HI in this study, hearing loss and vestibular dysfunction could be linked to their individual constraints. Many studies have highlighted vestibular dysfunction, as the individual constraint, was the main cause of balance deficits (Crowe & Horak, 1988; Suarez, Angeli, Suarez, Rosales, Carrera, & Alonso, 2007). However, the adolescents with HI in this study were not tested for vestibular dysfunction. Instead, the adolescents with HI in this study have sensorineural hearing loss (severe – profound hearing loss). Nonetheless, some studies have stated that the increased risk of vestibular dysfunction because of its association with hearing loss (Horak, Shumway-Cook, Crowe, & Black, 1988; Suarez et al., 2007). Further, it was noted that among the studies reporting significantly poorer balance in their participants with HI, most of these participants with HI have sensorineural hearing loss (Engel-Yeger & Weissman, 2009) or severe to profound hearing loss (Brunt & Broadhead, 1982; Hartman et al., 2011).

While this study suggested that sensorineural hearing loss as the individual constraint to account for the significantly poorer balance of the adolescents with HI, other studies would also consider environmental constraints. Various studies investigating children and adolescents with HI have observed different environmental constraints to account for the differences in motor abilities including balance (Dair, Ellis, & Lieberman, 2006; Gheysen et al., 2008; Wiegersma & Van der Velde, 1983). For example, researchers suggested the inadequate provision of conducive physical environment (Gheysen et al., 2008) and physical inactivity (Dair et al., 2006; Ellis, Lieberman, Fittipauldi-Wert, & Dummer, 2005; Zaccagnini, 2005) as possible environmental constraints. Wiegersma and Van der Velde (1983) also reported negative environmental factors such as frustration, shyness, over-protective and insecurity that deprive the population with HI from regular physical and movement opportunities. However, using different educational setting as environmental constraint to explain the significantly poorer balance abilities of adolescents with HI was not possible since they went through similar PE lessons in the same regular school.

## Conclusion

This study investigated if there was a difference in the motor skills between adolescents with HI and their hearing peers in an integrated Physical Education (PE) environment within the same educational setting in Singapore. The ecological perspective of Newell's (1986) constraints model can be used to describe the findings of the current study using the interaction of the individual, task and environmental constraints. The non-significant NDI, FM, GM, MP, PC and BD findings may be attributed to the fact that both adolescents with HI and their hearing peers have similar environmental constraints through attending similar PE lessons to develop their motor skills within a regular school. However, despite being in an

integrated PE setting, significantly poorer balance abilities of the adolescents with HI than their hearing peers are observed. While sensorineural hearing loss, as an individual constraint, seems to account for their poorer balance abilities, this study is exploratory in nature without comparison with other types of hearing loss. The explanation of different environmental constraints to explain poorer balance abilities was also not supported in this study and further investigation is warranted.

With the exemplification of inclusive education as the ‘Education for All’ (Armstrong, Armstrong & Spandagou, 2011) and the PE vision of “Every Child is Physically Educated in Singapore (MOE, 2006), more individualised balance-focused physical activities could be incorporated in students’ lifestyles to improve the balance abilities of adolescents with HI as a possible inclusive strategy. For example, this could be considered in the planning of PE curriculum whereby future PE lessons may emphasize on the elements of stability skills. From the repertoire of movements in existing educational gymnastics lessons, this could facilitate the development of balance control. However, the anticipated challenges to cater inclusive PE curriculum for the adolescents with HI would involve the provision for students with various special education needs of different motor abilities. Alternatively, the authors propose an early intervention with an intensive and structured balance programme for the adolescents with HI in addition to their regular PE lessons.

## References:

- Act, N. C. L. B. (2001). PL 107-110. *Washington, DC: US Department of Education*.
- Armstrong, D., Armstrong, A. C., & Spandagou, I. (2011). Inclusion: by choice or by chance? *International Journal of Inclusive Education*, 15(1), 29-39.
- Boyd, J. (1967). Comparison of motor behaviour in deaf and hearing boys. *American Annals of the Deaf*, 112, 598–605.
- Brunt, D., & Broadhead, G. D. (1982). Motor proficiency traits of deaf children. *Research Quarterly for Exercise and Sport*, 53(3), 236-238.
- Butterfield, S. A. (1986). Gross motor profiles of deaf children. *Perceptual and Motor Skills*, 62, 68-70.
- Butterfield, S. A. (1987). The influence of age, sex, hearing loss, etiology and balance ability on the fundamental motor skills of deaf children. In M. E. Berridge, & G. R. Ward (Eds.), *International Perspectives on Adapted Physical Activity* (pp. 43-51). Champaign, IL: Human Kinetics.
- Butterfield, S. A. (1991). Physical education and sports for the deaf: Rethinking the least restrictive environment. *Adapted Physical Activity Quarterly*, 8, 95-102.
- Butterfield, S. A., & Ersing, W. F. (1986). Influence of age, sex, etiology and hearing loss on balance performance by deaf children. *Perceptual and Motor Skills*, 62, 659-663.
- Crowe, T. K., & Horak, F. B. (1988). Motor proficiency associated with vestibular deficits in children with hearing impairments. *Physical Therapy*, 68(10), 1493-1499.
- Daniel, L. M., & Lim, S. B. (2012). The hearing screening programme for infants in KK Women’s and Children’s Hospital — Its development and role in reducing the burden of hearing impairment in Singapore. *Proceedings of Singapore Healthcare*, 21(1), 40-47.
- Dair, J., Ellis, M. K. & Lieberman, L. J. (2006). Prevalence of overweight among deaf children. *American Annals of the Deaf*, 151(3), 318-326.

- Dummer, G. M., Haubenstricker, J.L., & Stewart, D. A. (1996). Motor skill performances of children who are deaf. *Adapted Physical Activity Quarterly*, 13, 400-414.
- Ellis, M. K., Lieberman, L. J., Fittipauldi-Wert, J., & Dummer, G. (2005). Health-related fitness of deaf children – How do they measure up? *Palaestra*, 21(3), 36-43.
- Engel-Yeger, B., Golz A., & Parush, S. (2004). Impact of middle ear effusion on balance performance in children. *Disability and Rehabilitation*, 36(2), 97-102.
- Engel-Yeger, B., & Weissman, D. (2009). A comparison of motor abilities and perceived self-efficacy between children with hearing impairments and normal hearing children. *Disability and Rehabilitation*, 31(5), 352-358.
- Gheysen, F., Loots, G., & Van Waelvelde, H. (2008). Motor development of deaf children with and without cochlear implants. *Journal of Deaf Studies and Deaf Education*, 13(2), 215-22
- Hands, B., Larkin, D., & Rose, E. (2013). The psychometric properties of the McCarron Assessment of Neuromuscular Development as a longitudinal measure with Australian youth. *Human Movement Science*, 32(5), 1163-1175.
- Hartman, E., Houwen, S., & Visscher, C. (2011). Motor skill performance and sports participation in deaf elementary school children. *Adapted Physical Activity Quarterly*, 28, 132-145.
- Ho, L. Y. (2007). Child development programme in Singapore 1988 to 2007. *Annals Academy of Medicine Singapore*, 36(11), 898-910.
- Horak, F. B., & MacPherson, J. M. (1995). Postural orientation and equilibrium. In J. Shepard, & L. Rowell (Eds.), *Handbook of physiology* (pp. 255-292). New York, NY: Oxford University Press.
- Horak, F. B., Shumway-Cook, A., Crowe, T. K., & Black, F. O. (1988). Vestibular function and motor proficiency of children with impaired hearing or with learning disability and motor impairments. *Developmental Medicine and Child Neurology*, 30, 64-79.
- Lieberman, L. J., Volding, L., & Winnick, J. P. (2004). Comparing motor development of deaf children of deaf parents and deaf children of hearing parents. *American Annals of the Deaf*, 149(3), 281-289.
- Livingstone, N., & McPhillips, M. (2011). Motor skill deficits in children with partial hearing. *Developmental Medicine and Child Neurology*, 53(9), 836-842.
- Low, W. K. (2005). Managing hearing loss in children and adults: Singapore context. *Annals Academy of Medicine Singapore*, 34, 295-300. Retrieved from <http://www.annals.edu.sg/cpdMay05.html>
- Low, W. K., Pang, K. Y., Ho, L. Y., Lim, S. B., & Joseph, R. (2005). Universal newborn hearing screening in Singapore: The need, implementation and challenges. *Annals Academy of Medicine Singapore*, 34(4), 301-306.
- McCarron, L. (1997). *McCarron assessment of neuromuscular development: Fine and gross motor abilities* (revised ed.). Dallas, TX: Common Market Press.
- Ministry of Education. (2002, May). *Speech by MOS on Special Education*. Retrieved from <http://www.moe.gov.sg/media/speeches/2002/sp21052002f.htm>
- Ministry of Education. (2006). *Physical Education Syllabus (Primary, Secondary, Pre-University)*. Retrieved from <https://www.moe.gov.sg/docs/default-source/education/syllabuses/aesthetics-health-and-moral-education/files/physical-education.pdf>
- Ministry of Education. (2011, November 5). Special Education at a glance. *The Straits Times*, p. D3.
- Ministry of Social and Family Development. (2005, June). *Prime Minister launches the ComCare Fund*. Retrieved from <http://www.msf.gov.sg/web/Faces/Faces41/index.html>

- Newell, K. M. (1986). Constraints on the development of coordination. In M. G. Wade & H. T. A. Whiting (Eds.), *Motor development in children: Aspects of coordination and control* (pp. 341-361). Amsterdam, Netherlands: Martin Nijhoff.
- Polat, F. (2003). Factors affecting psychosocial adjustment of deaf students. *Journal of Studies and Deaf Education*, 8(3), 325-339.
- Schlumberger, E., Narbona, J., & Manrique, M. (2004). Non-verbal development of children with deafness with and without cochlear implants. *Developmental Medicine Child Neurology*, 46, 599-606.
- Schmidt, S., (1985). Hearing impaired children in physical education. *Adapted Physical Activity Quarterly*. 2, 300- 306.
- Stewart, D. A., & Ellis, M. K. (2005). Sports and the deaf children. *American Annals of the Deaf*, 150(1), 59-66.
- Suarez, H., Angeli, S., Suarez, A., Rosales, B., Carrera, X., & Alonso, R. (2007). Balance sensory organization in children with profound hearing loss and cochlear implants. *International Journal of Pediatric Otorhinolaryngology*, 71(4), 629-637.
- Tan, S. Y. J., Nonis, K. P., & Chow, J. Y. (2011). The balance control of children with and without hearing impairment – A case study. *International Journal of Special Education*, 26(3), 260-275.
- Weiss, A. H., & Phillips, J. O. (2006). Congenital and compensated vestibular dysfunction in childhood – An overlooked entity. *Journal of Child Neurology*, 21, 572-579.
- Wiegersma, P., & Van der Velde, A. (1983). Motor development of deaf children. *Journal of Child Psychology and Psychiatry*, 24, 103–111.
- Zaccagnini, K. J. (2005). How physical education teacher education majors should be preparing to teach Students with Hearing Loss: A national needs assessment. *American Annals of the Deaf*, 150(3), 273-282.

## **Using WebQuests to Promote Reading Comprehension for Students with Learning Disabilities**

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### **Abstract**

*This study examined students' ability to improve their reading comprehension through WebQuests that included instruction on story maps and online story reading. Seven students with learning disabilities at the middle school level participated in the study. During each session, on their own computer students independently read a story, reviewed story structure (plot, character, setting, and theme), filled in a story map, and answered a short comprehension quiz, as they navigated through the WebQuest. After five WebQuests, a survey gauged their perceptions of the experience. Students correctly identified the terms plot, character, setting and theme, but had difficulties applying the concepts of story structure to their readings. Overall, students found the WebQuests to be informative and helped them with their reading.*

**Keywords:** webquest, learning disabilities, reading comprehension, computer assisted instruction.

### **Introduction**

#### **Theoretical Framework**

Reading comprehension is a crucial skill in the adult world without which individuals struggle to follow even simple written directions or take in new information by means of written text. Most students acquire these skills in school, but many do not make adequate gains in their reading including those students identified with learning disabilities (LD). Ninety percent of the population of students with LD has difficulty reading independently (Stetter & Hughes, 2011) including difficulties with decoding, or the breaking down of letters into sounds and words or understanding the meaning of the words or sentences, otherwise known as comprehension (Stetter & Hughes, 2010b).

The need for good reading comprehension increases as students advance in their school

years with a myriad of skills involved including vocabulary knowledge, inference, critical reading and a meta-cognitive awareness of text structure and difficulty (Boardman, Buckley, et al., 2016). Since comprehension involves such a bundle of tasks, there are many methods or strategies for assisting students to develop better reading comprehension (Hall, Cohen, Vue, & Ganley, 2015) the importance of which the National Reading Panel (NRP) (2000) summarized. Students who receive strategy instruction in areas such as comprehension monitoring, cooperative learning, graphic and semantic organizers, story structure, question answering, question generation, summarization, and multiple strategy teaching improved their overall reading comprehension (Boardman, Buckley, et al., 2016).

Because students must learn and implement reading comprehension skills, or they do not ascertain new information (Gnaedinger, Hund, & Hesson-McInnis, 2016) problems in comprehension can severely limit students with LD's understanding of new material (Boardman, Vaughn, et al., 2016). As students progress through school, reading comprehension becomes more crucial as new material is presented increasingly in a written format (Connor, 2016). For students with LD, helpful instructional strategies include such methods as prior knowledge activation, story grammar/structure instruction, strategies instruction, peer programs, repeated readings, and vocabulary instruction (Boardman, Buckley, et al., 2016).

### **Story Structure and Story Mapping**

The NRP (2000) stated that certain areas of instruction assist students with reading problems more than others including instruction in story structure (Stetter & Hughes, 2010b). Story structure maintains that every narrative story has a beginning with rising action, intermediate events that promote the story, a story high point or climax, and a story closing with falling action and resolution. Syntheses of the research have shown instruction in story structure to promote learning (Boon, Paal, Hintz, & Cornelius-Freyre, 2015; Stetter & Hughes, 2010b). Other studies have focused on at-risk high school students' increased comprehension with story structure instruction (Stetter & Hughes, 2011) or younger students with LD and their introduction to story structure (Alves, Kennedy, Brown, & Solis, 2015)

The visual representations of story structure are called story maps which research has found to be a strong strategy for reading comprehension improvement (Boon et al., 2015). Repeated focus on this strategy improved the use of story structure, and comprehension in students with LD at the middle school level (Alves et al., 2015), while students with LD at the high school level learned better comprehension strategies by using story maps (Faggella-Luby, Schumaker, & Deshler, 2007). Many students with LD and reading comprehension difficulties have little or no concept of the structure of stories (Boon et al., 2015) meaning that explicit instruction in this area can help students with LD make gains in their comprehension (Alves et al., 2015). Though studies have shown that story structure and mapping instruction assist many students with LD in bettering their reading comprehension, questions remain on how best to teach students to use these methods. Perhaps computers could be used to better present story maps to students with LD.

### **Use of Computers in Reading Comprehension**

As computers became more common in schools, research focused on using them to teach reading to students, including those with LD, increased (Aleven, Beal, & Graesser, 2013). However, most of the research showed that having the technology available in classrooms does not necessarily impact students' instruction and learning (Cristia, Ibarrarán, Cueto, Santiago, & Severin, 2012). Although there is a growing amount of research on using computer tools and programs with students with LD (MacArthur, 2009), most studies researched drill and practice reading programs (Savage, Abrami, Hipps, & Geault, 2009). Programs that teach comprehension strategies and skills are more complex, since they include many more discreet components than

basic decoding practice, making clear research questions and data analysis more difficult. However, research completed to date using computer programs and tools to enhance comprehension of students with LD has increased comprehension skills (Boon et al., 2015; Cristia et al., 2012; Cullen, Alber-Morgan, Schnell, & Wheaton, 2014). Thus, using computers to enhance comprehension shows promise, but more research is needed as programs become available for students with LD.

Though the term hypertext emerged in the 1960's to refer to written language that did not have a predetermined order, its current use illustrates more fluid movement between the text itself and textual supports (Srivastava, Gray, Nippold, & Schneider, 2012) such as vocabulary definitions, additional information, study guides, and other supports. Hypermedia focuses on adding additional video or audio clips (Stetter & Hughes, 2010a). Many studies focused on hypertext, hypermedia and how they could benefit students with LD (Srivastava, et al., 2012). It is the flexibility of this medium that lends itself to increasing the learning of students with LD (Stetter & Hughes, 2010a).

A way to harness the flexibility of the Internet exists through the use of WebQuests which are websites that present an inquiry-based lesson with a teacher selected topic (Pak, 2015). Interlocking text pages guide students through the teacher-designed, project-specific website, as well as containing links to other relevant websites. The activity ultimately becomes a web-based scavenger hunt. WebQuests come in two forms, a shorter version (Akhand, 2015) where students can have a class-long WebQuest or a long term, week-long project version of a WebQuest. Sections of a WebQuest include an introduction to the topic, a task section which describes what students must do, a process section describing the activity components, and a resource section that links to helpful external websites (Leung & Unal, 2013). WebQuests provide structured guidance on the topic at hand and can hold students' interest through their varied yet systematic approach. Lessons become more meaningful with support of other resources such as original texts, photos, and meaningful background information websites.

Since there is an ongoing need for research in the area of computerized learning, especially with hypertext for students with LD (Stetter & Hughes, 2010a), the current study aimed to ascertain if, through the use of a WebQuest, students with LD can learn a comprehension strategy, story mapping, which has been shown to increase comprehension. Thus, the purpose of this pilot study was twofold: 1) to determine if a WebQuest designed to utilize story structure and story maps assisted the development of reading comprehension of students with LD and 2) to learn how students with LD felt about learning through a WebQuest.

## **Study Participants**

Seven seventh and eighth grade students (six male; one female) with LD from one middle school volunteered to participate in the study, after receiving parental permission. The middle school was located in a lower socioeconomic neighborhood in a major metropolitan city in the Midwest. The case manager of the school sent parents of students with LD a solicitation letter for the study to which 10 parents responded positively, and of those ten, seven students assented to participate in the study. All students were identified by the school as having LD and were receiving special education services. Reading levels of the seven students with mild to moderate LD were approximately at the third to fifth grade levels. All students participated in computer classes every week but it is unknown if students had previously completed WebQuests. Students received a gift certificate for their participation at the end of the study.

## **Materials**

Students met in the school's computer lab outside of school hours. Students worked individually

on a computer to perform all tasks associated with the WebQuests. The researchers constructed five WebQuests around five different stories with each story having multiple sequential webpages including: an explanation of the task at hand, a page explaining plot, character, setting, and theme, a sample story map, the story the students were to read with links to vocabulary, a story map to fill in, and a short multiple choice quiz. Students made their way through each WebQuest at their own pace. At the end of each WebQuest, both the story map and the quiz were sent to the researchers via email after student completion.

The stories used were all narrative fiction; with four out of the five having surprising endings (see Table 1). Using the Fry readability formula, researchers determined the grade level for each story with scores that ranged from third grade to fourth grade reading levels. Except for one student who claimed to have read the first story previously, all the stories were new to the students.

**Table 1. Stories**

Name	Author	Words	Level	Brief Synopsis
“After Twenty Years”	O. Henry	1,175	4 <sup>th</sup>	Two friends are supposed to meet, as promised after twenty years. Each had taken opposite roads, one becoming a policeman and the other a thief.
“The Apple Box”	Joe McManus	2,704	3 <sup>rd</sup>	Two young students use an apple box in various ways. Eventually they involve their town in helping an older neighbor.
“Key Item”	Isaac Asimov	878	3 <sup>rd</sup>	A computer that the entire world depended on stopped working. One technician realized it had developed feelings.
“A Man Who Had no Eyes”	O’Henry	1023	3 <sup>rd</sup>	A beggar and a businessman meet on the street after years. Both had survived a workplace fire and were blind. The beggar had tried to kill the other man.
“The Pen Pal”	Margaret Poynter	817	3rd	A young girl waited to meet her pen pal when she was kidnapped and replaced by an alien, just as she had done to someone else several years before.

### Procedures

The students met for an hour after school for a total of five sessions. Students who missed sessions were allowed to schedule make-up sessions with five of the students needing to reschedule at least one session. Students completed all make-up sessions within a month of the start of the study; however several students were unable to complete all the sessions due to their extensive after school activity schedule.

At the first session, researchers informed the students that they could ask for help if they had any procedural questions about the WebQuests as they worked independently on their computers. They proceeded at their own pace through the story and other sequentially presented information on the WebQuest. Students read the story, filled out a story map and completed reading comprehension questions on the web pages during each session. A researcher circulated throughout the group, helping students with procedural or internet access difficulties. No students appeared to be frustrated and none quit working during a session.

## Instruments

### Story maps and quizzes.

Each of the five story maps, one for each of the stories, had blank spaces for two main character names, and larger blank spaces for setting, plot, each of the characters, and theme where students wrote descriptions of the parts of each story. For each answer, their responses were scored either correct or incorrect. The researchers scored plot in a slightly different manner because it contained several blank boxes; thus plot scored correct, partially correct, or incorrect. Students could score up to six points for correctly completing the five responses per story map. After each WebQuest, students completed an online comprehension quiz that consisted of three to six questions with students' responses emailed directly to the researchers.

### Story structure assessment

During the final session, students completed a short, researcher-made assessment to ascertain their understanding of story structure which included four matching questions on the words: plot, character, setting and theme.

### Perception survey

At the end of the study, the students took a ten question online survey, in the form of a five-point Likert scale, which included strongly agree, agree, no opinion, disagree, strongly disagree and no answer. The questions solicited student feedback regarding the ease of use of the webpages and their perceptions about learning online. Other questions asked whether or not students felt the WebQuest helped them with their reading comprehension, if they learned new things, and their like or dislike of the activity. The survey also included questions about the difficulty of the stories and activities. Student took the survey during their final session with one student not completing the survey due to missing the final session. The researchers reported the results using percent of students who answered a given statement with a given rating.

## Results

### Story Map

The story map assisted students in identifying the characters, setting, plot and theme of the story. Completing the story map proved difficult for most students, but some sections appeared to easier than others for them (see Table 2 and Table 3).

**Table 2. Total Correct for Combined Story Map and Quiz**

Student	Story 1 (12 max)	Story 2 (12 max)	Story 3 (12 max)	Story 4 (9 max)	Story 5 (11 max)
Angel	8	7	9	6	6
Jose	6	7	6	5	6
Velma	NA	4	1	2	3
William	8	9	5	6	3
Marco	9	9	NA	NA	6
Edgar	NA	7	7	6	NA
Leo	NA	9	7	NA	NA

Note. NA= no score as student did not make-up session.

### Character

Most students correctly identified the two main characters of each story, but giving a description of the characters presented more of a challenge for them. Though results were mixed on the first two WebQuests with respect to character description, at least half of the students were able to correctly describe the main characters. Students had more difficulties on the last two WebQuests.

Only one student correctly identified character traits, while no one wrote the description correctly on the last day.

### **Setting**

Identifying the setting was more difficult than identifying the characters for the students. Students performed better on the first and fourth WebQuests than the others. One student was able to identify the setting correctly on four out of five WebQuests, while one other student scored two out of five WebQuest settings correct. The other students were only able to correctly identify the setting during one session.

### **Plot**

For the plot, students had to complete multiple components on the story map. One space was for the initiating event, while the others were for other events in the story. There was also space to write the high point or climax of the story. The daily average was that about half of the students got the retelling of the plot partially correct. The four students who participated in the first story got the first story's plot partially correct. Other student WebQuests' scores did not achieve the first day's high. However, most of the students were able to recount some aspects of the plot of the stories.

### **Theme**

Theme presented the most difficulty with most students unable to correctly identify it. However, two students were able to correctly identify the theme of the second, more formulaic story, saying that "*It's make new friends*".

**Table 3. Percent of Students Who Achieved Correct Scores on Story Map by Section**

	Story 1	Story 2	Story 3	Story 4	Story 5
Character	75	86	100	100	100
Character description	75	57	50	20	0
Setting	75	43	0	60	20
Plot	100	43	50	60	40
Theme	0	0	0	0	0

### **Comprehension Quiz**

The students received many perfect scores on the session quizzes, which they took after finishing each WebQuest. Students did very well on the first and second stories but had a greater variability in scoring on later stories. Overall, students seemed much more comfortable with the multiple-choice format than the story map format, because they received better scores.

**Table 4. Perception Survey Results**

	Strongly Agree	Agree	Neither	Disagree	Strongly Disagree
The WebQuest was easy to use.	50%	33%	17%	0%	0%
The WebQuest helped me with my reading.	17%	84%	0%	0%	0%
I understood the directions.	50%	33%	17%	0%	0%
I liked doing the WebQuest.	17%	67%	17%	0%	0%
The WebQuest stories were too hard.	17%	0%	0%	67%	17%
I did not like filling out the story map.	0%	33%	17%	17%	33%
The comprehension questions at the end of the WebQuest were too hard.	0%	17%	33%	17%	33%
I did not use the vocabulary page.	0%	17%	33%	50%	0%

I went back to the story page.	17%	50%	33%	0%	0%
I learned new things from the WebQuest.	50%	50%	0%	0%	0%

### Perception Survey

The perception survey (see Table 4) gauged the students' reactions to using WebQuests to assist with their reading comprehension. The survey findings indicated that 83% of students either agreed or strongly agreed with the following statements: "*The WebQuest was easy to use*" "*I understood the directions in each WebQuest,*" and "*I liked doing the WebQuest*". One hundred percent of the students agreed or strongly agreed with the statements, "*I learned new things from the WebQuest*" and "*The WebQuest helped me with my reading.*" The majority of the students reported having a positive experience with the WebQuests.

### Discussion

Students in the study performed better on the comprehension quizzes at the end of each WebQuest compared to their performance on the story map embedded as an activity in the WebQuest. Student performance generally showed that students comprehended the stories, but did not understand the purpose of the story map strategy. Another possibility is that the story map activity led the students to increased comprehension of the text, so that they could perform better on the short quiz (Blakenship, Ayres, & Langone, 2005), but results on this pilot study were inconclusive due to confounding variables further discussed in the limitations and implications section.

Filling out the story map appeared to have been a very complex task for the students to do independently. With the exception of identifying and describing the characters, students had trouble with notating important plot points, describing the setting, and summarizing the theme of the story. No progress was shown in the course of this investigation (Stetter & Hughes, 2011).

The perception survey results were telling. Overall, students found the WebQuest easy to use, the directions were clear, and most felt that the passages were easy to read. The one student who responded that the passage was difficult to read scored lower on most quizzes demonstrating that he was having more comprehensive or decoding difficulties than the rest of the students. This aligns with previous work that shows that students report a positive experience overall with working on the computer (Stetter & Hughes, 2010a). The procedural questions about the use of the vocabulary page, the story passage as reference, and whether or not the students liked filling out the story map were low at 50%. The vocabulary definitions and story passage were only a click away, but many students in the study found even that extra effort somewhat difficult by their own self report of support usage. Other research literature reports that students with LD are often overwhelmed with too much information (Boon et al., 2015). The most encouraging responses in the perception survey were that all of the students felt that they learned something from the WebQuest and that it helped with their reading. Students typically have positive reactions to working with WebQuests (Leung & Unal, 2013). Certainly, this sort of one-on-one work can help students improve their own reading comprehension (MacArthur, 2009). Overall, the students were very interested in the WebQuests, offering many suggestions to the researchers including that they would like to have the passage read to them through the computer and headphones, much as early computer research had done (Higgins & Boone, 1991). They also felt that using a multiple choice format would be much easier in filling out the story map since the story maps contained information that was typed and composed by the students themselves which is more of a writing task and difficult for students with LD.

### Limitations and Implications

The students had only five WebQuests to complete in this study, making it difficult to see a treatment effect on students' comprehension with such a short intervention period. Generally, students with LD need more instruction in strategies than peers who are functioning at grade level

(Boardman, Vaughn, et al., 2016). Perhaps students would have benefitted from several weeks or months of intervention in order to best internalize the ideas behind the strategy (Stetter & Hughes, 2010a).

Additionally, not all students completed all sessions. Students had many conflicts from their extracurricular activities that prevented their completion of the WebQuests, with only three students completing all five sessions. Makeup meetings would be rescheduled and then missed. To really gauge the effectiveness of the intervention a much more in-depth and mandatory schedule was needed.

Students completed their work at their own pace but perhaps needed brief mini-lessons about the material along with a clear teacher-provided structure for how the lesson would function. Students benefit from direct teacher instruction and perhaps the concept of story structure/story mapping was too difficult a concept for students with LD to grasp because they needed multi-modal and repeated support to fully understand it (NRP, 2000). Future work in how mini-lessons fit with computer activities or in overall teacher lesson plans about reading and reading comprehension could benefit both students and the field.

Also unknown is student utilization of supports linked to the story maps. Did they utilize the vocabulary definitions or the sample story map? How often did they reference the story itself? The current research did not track this and perhaps a glimpse into students' online utilization of supports would provide a better picture of how best to optimize future versions for students with LD. Knowing more about what students used could perhaps inform teachers in their instruction of students with LD about how to utilize the supports provided by the WebQuest. Perhaps they did not understand that the associated pages would help. Teaching students to better utilize supports could be explored in future work.

Overall, the intervention was reading and writing intensive, two tasks that are often exceedingly difficult for students with LD (Boardman, Vaughn, et al., 2016). In future, it might be better to follow student suggestions and include the ability for students to use drop down menus for multiple choice answers instead of writing them in the online boxes themselves and to provide limited to extensive use of word and passage reading so that students could ease their passage decoding to better understand the story structure strategy.

Teacher instruction in reading comprehension is especially crucial when paired with instruction on the computer (Dynarski, et al., 2007). Due to students with LD having difficulties in motivation and organization (Mastropieri & Scruggs, 2007) explicit, in-depth, repeated instruction in reading comprehension strategies may assist them (Gnaedinger, et al., 2016) and computers are one way to facilitate this. This instruction could be paired with overall exposure to print so that they have extensive ability for guided practice of the strategies which they are learning. However, more study is needed in the area of hypertext and hypermedia instruction with students with LD (Stetter & Hughes, 2010a); not only to see if this could improve comprehension, but also modifying curriculum for students who need support. Additionally, story map instruction is a strong, strategic way of improving reading comprehension (Stetter & Hughes, 2010b) and can be reinforced through the use of computer tools and programs, such as WebQuests. However, much more experimentation is needed to ascertain the full possibility of use of WebQuest instruction (Pak, 2015)

## References:

Akhand, M. M. (2015). Project based learning (PBL) and Webquest: New dimensions in achieving learner autonomy in a class at tertiary level. *Journal of Pan-Pacific Association of Applied Linguistics*, 19(2), 55-74. Retrieved from  
<http://www.eric.ed.gov/contentdelivery/servlet/ERICServlet?accno=EJ1092455>

Aleven, V., Beal, C., & Graesser, A. (2013). Introduction to special issue on advanced learning

technologies. *Journal of Educational Psychology*, 105(4), 929–931.

Alves, K. D., Kennedy, M. J., Brown, T. S., & Solis, M. (2015). Story grammar instruction with third and fifth grade students with learning disabilities and other struggling readers. *Learning Disabilities -- A Contemporary Journal*, 13(1), 73-93. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true> HYPERLINK

Blakenship, T. L., Ayres, K. M., & Langone, J. (2005). Effects of computer-based cognitive mapping on reading comprehension for students with emotional behavior disorders. *Journal of Special Education Technology*, 20(2), 15-23.

Boardman, A. G., Buckley, P., Vaughn, S., Roberts, G., Scornavacco, K., & Klingner, J. K. (2016). Relationship between implementation of collaborative strategic reading and student outcomes for adolescents with disabilities. *Journal of Learning Disabilities*, 49(6), 644-657. doi:10.1177/0022219416640784

Boardman, A. G., Vaughn, S., Buckley, P., Reutebuch, C., Roberts, G., & Klingner, J. (2016). Collaborative strategic reading for students with learning disabilities in upper elementary classrooms. *Exceptional Children*, 82(4), 409-427. doi:10.1177/0014402915625067

Connor, C. M. (2016).

A lattice model of the development of reading comprehension. *Child Development Perspectives*, 10(4), 269-274. doi:10.1111/cdep.1220 Cristia, J., Ibarrarán, P., Cueto, S., Santiago, A., & Severin, E. (2012). Technology and child development: Evidence from one laptop per child program. Bonn, Germany.

Cullen, J. M., Alber-Morgan, S. R., Schnell, S. T., & Wheaton, J. E. (2014). Improving reading skills of students with disabilities using Headsprout comprehension. *Remedial and Special Education*, 35(6), 356-365.

Dynarski, M., Agodini, R., Heaviside, S., Novak, T., Carey, N., Campuzano, L., Sussex, W. (2007). Effectiveness of Reading and Mathematics Software Products: Findings from the First Student Cohort. Retrieved from Washington, DC:

Faggella-Luby, M., Schumaker, J. S., & Deshler, D. D. (2007). Embedded learning strategy instruction: Story-structure pedagogy in heterogeneous secondary literature classes. *Learning Disability Quarterly*, 30(2), 131-147.

Gnaedinger, E. K., Hund, A. M., & Hesson-McInnis, M. S. (2016). Reading-specific flexibility moderates the relation between reading strategy use and reading comprehension during the elementary years. *Mind, Brain & Education*, 10(4), 233-246. doi:10.1111/mbe.12125

Hall, T. E., Cohen, N., Vue, G., & Ganley, P. (2015). Addressing learning disabilities with UDL and technology: strategic reader. *Learning Disability Quarterly*, 38(2), 72-83. doi:10.1177/0731948714544375

Higgins, K., & Boone, R. (1991). Hypermedia CAI: A supplement to an elementary school basal reading program. *Journal of Special Education Technology*, XI(1), 1 15.

Leung, C. B., & Unal, Z. (2013). Advantages and disadvantages of classroom instruction with Webquests: Connecting literacy and technology. *Journal of Reading Education*, 38(2), 31-38. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true> HYPERLINK

MacArthur, C. A. (2009). Reflections on writing and technology for struggling writers. *Learning Disabilities Research and Practice*, 24(2), 93–103.

Mastropieri, M. A., & Scruggs, T. (2007). *The inclusive classroom: Strategies for effective instruction* (4 ed.). New Jersey: Pearson.

NRP. (2000). National Institute of Child Health and Human Development Report of the National Reading Panel. *Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction* (NIH Publication No. 00-4769). Washington, DC: U.S. Government Printing Office.

Pak, M. (2015). Developing academic technology skills with WebQuests. *California English*, 21(1), 11-13. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true> HYPERLINK  
Savage, R. S., Abrami, P., Hipps, P., & Geault, L. (2009). A randomized control trial study of the Abracadabra reading intervention program in grade 1. *Journal of Educational Psychology*, 101(3), 590–604.

Srivastava, P., Gray, S., Nippold, M., & Schneider, P. (2012). Computer-based and paper-based reading comprehension in adolescents with typical language development and language-learning disabilities. *Language, Speech & Hearing Services in Schools*, 43(4), 424-437. doi:10.1044/0161-1461(2012/10-0108)

Stetter, M. E., & Hughes, M. T. (2010a). Computer-assisted instruction to enhance the reading comprehension of struggling readers:

## **A Pilot Study for Extracting Psychometric Properties of an Adapted Jordanian Version of the Parents ' Evaluation ODF Developmental Milestones (PEDS:DM)**

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### **Abstract**

*This study aimed to extract the psychometric properties of a Jordanian version of the Parents Evaluation of Developmental Status: Developmental Milestones (PEDS:DM) to present a psychometrically reliable Arabic scale that benefits the Jordanian context as an effective childhood intervention scale. The validity of the scale was achieved in three ways: Face, construct, and concurrent validity. Face validity was accomplished through the translation steps. As for construct validity; the internal consistency of the translated version was checked. The correlation between the items and sub-scales was high, which indicated high construct validity. Lastly, the concurrent validity was obtained by calculating the Pearson correlation between the Arabic version of the PEDS:DM and the Preschool and Kindergarten Children's Performance scale (PKCPS). The significance of correlated validity for the domains of the scale was as follows: Cognitive (0.79), physical (0.83), social (0.82), and total score (0.84). The indicators of reliability were extracted in two ways: The scale's test-retest reliability, and the internal consistency reliability. The values of the coefficients of reliability for the test-retest ranged between (0.88-0.92) for the different domains, and (0.91) for the total mark. The coefficients of reliability for internal consistency using Cronbach's Alpha had values between (0.82-0.91) for the different domains, and (0.89) for the total mark. Consequently, the Jordanian version of the PEDS:DM is psycho-metrically valid and reliable. As a result, this scale is one of the first instruments that can be implemented safely in the Jordanian context to achieve early detection of any developmental delays in children.*

**Keywords:** *Psychometric Properties, Parents Evaluation of Developmental Status: Developmental Milestones (PEDS:DM), Jordanian Version, Childhood Intervention, Educational Measurement, Developmental Delay among Children.*

## Introduction

Young children develop rapidly, and development can be defined, in part, as the process of change in an individual over time. Children of the same chronological age are not necessarily at the same stage or level of anticipated development, possibly because they mature at different rates and have different experiences and opportunities (Wortham, 2008). According to Coghlan, King, and Wake (2003), approximately 20% of young children have significant problems in one or more areas of their development—physical, social, and emotional. It is generally accepted that early detection and intervention lead to a broad range of better outcomes for affected children and their families. Developmental delays in many children are not detected at an age when intervention might be expected to be most beneficial.

Early intervention is important as it has been shown to improve cognitive and other developmental outcomes, which later translate to greater academic achievement, less grade retention and need for special education, lower drop-out rate, and higher college enrollment (Glascoe, 2000). Furthermore, early intervention has proven to improve family functioning and interaction which results in beneficial outcomes for society (Thomas, 2016).

According to Delaney and Smith (2012), both physical and mental health problems in early childhood lead to poorer adult health. Those who are unidentified as having developmental difficulties until school age do not receive the benefits associated with early intervention services. Recent research continues to support the critical need for early intervention (Spittle, Orton, Doyle, & Boyd, 2007; McCormick et al., 2006).

To meet the goal of intervention the assessment process is designed to gather relevant behavioral information (Dawson & Guare, 2004). Wortham (2008) asserts that the importance of assessment includes identifying special needs, supporting the learning process, and evaluating special programs. In early childhood the assessment process involves more than just testing. It includes many strategies that uncover the understanding and determine the development of individual children (Brewer, 2004). Thus, the purpose of assessment is to benefit the child, and the purpose of evaluating infants and toddlers is generally to determine whether the child is developing normally or showing delay that requires a need for assistance or support (Wortham, 2008). Attaining a comprehensive assessment of a child's development requires many procedures. The process needs clear identification of outcomes, adequate analysis of data, and deep reflection on the results (Alade & Buzzetto-More, 2006).

The process of assessing child development is usually conducted using conventional, norm-referenced testing practices to determine whether young children might be experiencing developmental delay. Conventional tests have been neither developed for, nor field-validated on infants, toddlers, and preschoolers with developmental disabilities (Neisworth & Bagnato, 2004). In carrying out early childhood screening, it is important to gather information regarding young children's natural behaviors as they occur in their daily routine. This systematic process is called authentic assessment, which provides insights about the performance of the child and his or her social, physical, and intellectual characteristics and needs (Ricketts, 2006).

Even though many professionals rely upon conventional norm-referenced testing in their work with children, that the implemented traditional intelligence tests, even by

specially-trained preschool psychologists, fail to accomplish the major purpose of assessment for early intervention (Bagnato, 2007). Conventional tests and testing practices fail to be useful for early childhood intervention for two essential reasons. The first reason is that they require situations and behaviors that are separated from the child's natural developmental ecology. Furthermore, they fail to enable success in planning beneficial goals and programs for children. Therefore, comprehensive assessment in early childhood must have immediate and continuous benefits for the child in terms of planning programs and interventions that work (Bagnato, 2007).

Early childhood assessment is a flexible and collaborative decision-making process. In this process, parents and professionals repeatedly revise their judgments to reach a consensus about the needed developmental outcomes and the required types of services that are functional and family-centered (Bagnato & Neisworth, 2004; Snow, 2008). According to Bagnato (2007) there are two fundamental tenets of successful authentic assessment of children. The first is that assessment contexts, content, and procedures must be developmentally appropriate for children. The second is that there must be a successful cooperation with parents and primary caregivers. Parents' involvement is crucial because they provide data that cannot be obtained without their participation (e.g., sleep patterns, social skills, difficulties in community settings, and toileting behavior). Authentic assessment requires adequate training for early childhood professionals to enable them to observe and record the required data and information (Ricketts, 2006).

A critical piece of the Informal Assessment Measurement process, when assessing a youngster's development, is to gather information from those who know the child best, usually parents and teachers (Dawson & Guare, 2004). Asking parents specific questions regarding their child's behavior can yield information that is invaluable, as parents do not necessarily differentiate between a child's behavior and their development, which allows for a unique perspective. Developmental delays often manifest themselves through the behavior of the child (Glascoe, 2000; Sices, Feudtner, McLaughlin, Drotar & Williams, 2003). A recent trend in developmental screening attempts to address the number of very young children who fail to be identified as having developmental difficulties, alleviating the burden by physicians using the information reported by parents (Dawson & Guare, 2004).

### Rationale and Purpose of the Study:

In 2003, the Ministry of Education (MoE) in Jordan announced an initiative that is entitled: Education Reform for the Knowledge Economy (ERFKE). The main goal of this initiative was to promote the quality of the teaching process at all levels of early childhood education (Abu-Jaber, Al-Shawareb, & Gheith, 2010). Accordingly, a team for Early Childhood Development (ECD) was assigned. The team completed an extensive strategy document that analyzed and provided an overview of the current situation of young children in Jordan. One of the urgent topics that was highlighted in this document was the need to gather adequate information regarding child development and parents' involvement (UNICEF, 2003).

Therefore, the purpose of this study is to obtain and provide an Arabic Jordanian version of an adequate tool for Surveillance and Screening. Specifically, the selected tool is the PEDS:DM that is culturally aligned with the Jordanian culture and psycho-metrically valid and reliable. The PEDS:DM, Parents Evaluation of Developmental Status: Developmental Milestones, is a tool for Surveillance and Screening, developed by Glascoe and Robertshaw (2010). The PEDS:DM is a fast, brief, flexible, reliable and accurate indicator of children's skills across developmental domains that contains six to eight items per encounter or age level. It is designed for children zero to 7 years and 11 months, with additional measures for older children and adolescents. Further information on this scale will

be presented in the scale's description section.

### **Literature Review of PEDS Instrument:**

The importance of the PEDS questionnaire was investigated in previous literature. For example, a study was conducted by Coghlan, King, and Wake (2003), in which complete parent and caregiver PEDS data were available for 262 children (67% response: 47% boys; 53% girls) aged from 18 months to 5 years and 9 months. Most parents found the PEDS questionnaire was easy to complete (98%) and likely to be useful to health professionals (89%). Twenty-four children (9%) were classified as being at high-risk for disabilities and 49 (19%) were classified as being at medium-risk of disabilities.

The PEDS has been found acceptable to parents of Australian preschool children, with a prevalence of significant concerns (i.e. children at high and medium risk of developmental problems) similar to those in the USA (Coghlan, King, & Wake, 2003). Cox, Huntington, Saada, Epee-Bounya and Schonwald (2010) conducted a study that aimed to better understand the utility of using the Parents' Evaluation of Developmental Status. 752 PEDS forms, for children aged 6 months to 9 years, and 3 to 5 years were reviewed. Ninety percent of the parents endorsed at least one concern and parents qualified 27.5% of their concerns with a written comment. In 23.9% of cases in which parents identified a concern and provided a written comment, the content of the comment did not match the question's intent; rates of mismatch were similar for the English and Spanish forms. Among comments regarding behavioral concerns, 12% reflected a misunderstanding of age-appropriate behavior. Medical concerns accounted for 14.1% of the comments. More than a quarter of the comments reported behavior or development that was on target or advanced for the child's age.

Limbos and Joyce (2011) investigated the developmental screening measures; the Ages and Stages Questionnaire (ASQ) and the Parents' Evaluation of Developmental Status (PEDS). These measures of children's development were presented to their primary care providers. A sample of 334 children aged 12 to 60 months was recruited. Parents completed the PEDS and the ASQ in their home or the primary care clinic of one of the investigators. The mean age of the children was 32.3 months. Developmental delay was identified in 34 children (10%). The findings highlighted that the PEDS had moderate sensitivity (74%) but low specificity (64%), comparatively. Thus, the PEDS has reasonable scale characteristics for developmental screening in primary care settings.

Moreover, Bedford, Walton, and Ahn (2013) aimed to identify existing outcome measures to assess the development of children aged between 2 and 2.5 years in several developmental domains including the cognitive, physical, and social aspects. Starting from 35 measures which met the inclusion criteria of the study, two measures: the ASQ and PEDS:DM satisfied the requirements best. The study further affirmed the validity and reliability of the scales in reference to the measure itself, as well as the expert advice of various researchers including the authors of the PEDS:DM. Finally, the review referred to another review by Halle (2011) which compared the PEDS to 14 other developmental assessments and found it to compare well.

## **Methods**

### **Setting and Participants**

In order to extract the psychometric properties of a Jordanian version of the Parents Evaluation of Developmental Status: Developmental Milestones (PEDS:DM), one hundred and twenty-eight children four to seven years old were selected randomly from private schools. The final version of the translated scale was administered to these 128 children

through the parent's evaluation of their own children.

## Procedure and Measures

### *Description of the Original Scale*

Each item in the PEDS:DM accesses a different developmental domain: expressive and receptive language; fine and gross motor; self-help; social-emotional; and for older children, academic and pre-academic skills. It can be administered by parental report or directly to children. The scale takes less than five minutes to administer and one minute to score using the laminated book of scale items. It is highly accurate: sensitivity and specificity range from 70% to 95% across domains and age levels.

Items on the PEDS:DM were drawn from standardization and validation studies of two diagnostic-level instruments, the Inventory of Early Development II and the Comprehensive Inventory of Basic Skills-Revised. A total of 112 items met selection criteria, resulting in one item per domain per age level (grouped in one to three-month intervals in the first and second years of life, and in four to six-month intervals up to five and a half years of age, and semi-annual intervals thereafter). Domains included fine motor, including written language (in older children), self-help, gross-motor, expressive language, receptive language, social-emotional, and, for older children, maths and reading. Thus, at each age level, six to eight items, one per domain, were included in the final selections. In some domains, especially with older children, there were either no items available or those that were available failed to discern problematic from average performance. In these cases, some domains were dropped after certain ages (e.g. gross motor for children four and a half years of age and older).

The accuracy of the PEDS:DM according to developmental areas in identifying performance in the same domain on the IED-II/CIBS-R was as follows: Fine Motor Domain (Sensitivity of 86%, Specificity of 81%); Gross Motor Domain (Sensitivity of 87%, Specificity of 82%); Expressive Language Domain (Sensitivity of 83%, Specificity of 86%); Self-Help Domain (Sensitivity of 88%, Specificity of 87%); Receptive Language Domain (Sensitivity of 81%, Specificity of 86%); Social-Emotional Domain (Sensitivity of 75%, Specificity of 85%); Academic/ Pre-academic Domain (for children 39 months and older with maths and reading combined) (Sensitivity of 80%, Specificity of 82%); and Total Domain (Sensitivity of 83%, Specificity of 84%).

Guttman's Lambda coefficient was used to view the internal consistency of the PEDS:DM. Across domains this produced a value of (.98). The finding illustrates that items within each domain of the PEDS:DM cluster to form a distinct and cohesive set of developmental skills. Test-retest reliability (meaning that the same examiner retested the child within one week) produced agreement of (.98) and (.99) on a sample of 75 children who were re-administered the entire IED-II or CIBS-II. Inter-rater reliability, across two different examiners retesting a sample of 77 children, revealed agreement of (.82) to (.96) across subtests. Of the 112 items on the PEDS:DM, 67 were standardized both by parental report and by examiner administration. On these, kappa was (.81) indicating a high level of concordance between parent administration and direct administration by professionals or paraprofessionals.

Analysis of readability was conducted for items on each form of the PEDS:DM. Because readability formulas depend in part on sentence length, inclusions of the short phrases used as response options can produce a reading level result that is lower than in actuality. With response options excluded, the Flesch-Kincaid index produced a reading level of (1.8) grades (range 1.1-2.6), well within the recommended readability recommendations for parent-oriented medical literature.

## Translation Steps

### *Primary Translation*

Authors of the study have directly contacted PEDS Inc. to obtain permission of use, and started the translation process from English into Arabic, taking into account that the translation needs to be similar to the original version in terms of language (vocabulary), meaning, and content aspects; as well as being culturally appropriate for the Jordanian culture. In this regard, the scale was translated word by word and item by item. Then, the translation was informally reviewed by two professors working at the University of Jordan, who are proficient in both languages. Their comments were obtained with regard to the translation content, cultural appropriateness, and resemblance to the original scale. Minor adjustments (basically related to vocabulary choice) were recommended and applied to the translation.

### *Formal Revision*

Four faculty members in the Departments of Curriculum and Instruction, Counselling and Special Education, and Educational Psychology at The University of Jordan, reviewed the primary translation individually, according to the following criteria: (a) the linguistic correctness (word by word translation/vocabulary correctness) of the translation in comparison to the English version; (b) the content resemblance (Each item in the translated version should be similar to the one in the original version in terms of content, meaning, and the purpose of measurement of the item; the total number of items should be similar to the ones in the original version; the total number of subscales and the sequential of subscales should be similar in both versions; and completion directions should also be similar in both versions); (c) the cultural appropriateness of each item's content for the Jordanian culture; and (d) the comprehensibility and clarity for its targeted populations. All comments made by the reviewers were mainly related to improving and modifying the readability of the items included in the translation. All of these comments were taken in consideration and modifications were made on the translated version.

### *Back Translation (from Arabic to English)*

Back translation is another procedure to assure the translation correctness and the ability to match the original version. A faculty member, who is proficient in Arabic and English, in the department of Educational Psychology/College of Education at The University of Jordan, translated the translation back from Arabic to English. This back-translated version, then, was compared with the original English version item by item to ensure that it was similar to the original one.

### *Final Version*

As a result of the previous steps, the final translation of the PEDS:DM into Arabic was obtained. Finally, an Arabic language teacher reviewed the final translated version for the purposes of checking the Arabic language accuracy (syntax accuracy). A few grammatical corrections were made, without impacting the meaning, for the purpose of satisfying the correct Arabic language grammar criteria.

## Validity Indicators

The validity of the PEDS:DM scale was achieved in three ways. The methods included face validity, concurrent validity, and construct validity. The following paragraphs describe each of these methods.

- Face validity that was accomplished through the previously mentioned translation steps.

- Concurrent validity was obtained by calculating the Pearson correlation between the Arabic version of the PEDS:DM and the Preschool and Kindergarten Children's Performance scale (PKCPS) which was established and developed by Al-Batch (2001). The PKCPS (Al- Batch, 2001) consisted of 50 behavioral aspects, which cover ten sub-areas, within three main domains of growth: cognitive, physical and social. Each of these domains has been embedded within a number of sub-areas.
- Construct validity: the internal consistency of the translated version was checked through calculating the correlation coefficient between the sub-scales forming the PEDS:DM, and the total score of the scale. Table (1) shows the results of these computed correlations.

**Table 1. Correlation coefficient between the sub-scales forming the PEDS:DM, and between the total score of the scale**

	Item No.	Sub-scales	Total Score
Fine Motor	A1	.303 **	0.097
	A2	.645 **	0.061
	A3	.716 **	0.002
	A4	.709 **	-.048-
	A5	.669 **	0.089
	A6	.721 **	-.049-
	A7	.725 **	-.082-
	A8	.611 **	0.112
Self Help	B1	.464 **	-.117-
	B2	.218 *	0.09
	B3	.485 **	0.093
	B4	.360 **	0.066
	B5	.408 **	-.093-
	B6	.545 **	.235 **
	B7	.379 **	0.097
	B8	.325 **	-.033-
	B9	.434 **	-.068-
	B10	.420 **	0.173
Receptive Language	C1	.355 **	0.046
	C2	0.075	0.064
	C3	0.076	-.181-*
	C4	.299 **	-.097-
	C5	.202 *	0.031

	C6	.393**	0.038
	C7	.359**	-.173-
	C8	.612**	0.002
	C9	.726**	0.01
	C10	.569**	.248**
	C11	.555**	0.16
Expressive Language	D1	.446**	0.101
	D2	.384**	0.008
	D3	.606**	0.121
	D4	.544**	-.004-
	D5	.624**	.177*
	D6	.400**	0.019
	D7	.588**	0.021
	D8	.606**	0.173
Gross Motor	E1	.669**	0.054
	E2	.460**	-.037-
	E3	.473**	0.104
	E4	.254**	-.064-
	E5	.729**	0.171
Social Emotional	F1	.247**	-.127-
	F2	.236**	-.139-
	F3	.402**	0.111
	F4	.381**	-.037-
	F5	.328**	0.027
	F6	.503**	0.018
	F7	.375**	-.081-
	F8	.623**	-.021-
	F9	.567**	0.028
	F10	.505**	.180*
Academic	G1	-.085-	-.062-
	G2	.367**	0.035
	G3	.466**	-.048-
	G4	0.119	0.002
	G5	.386**	-.019-
	G6	.421**	0.104

	G7	.596**	0.04
	G8	.476**	0.109
	G9	.525**	.223*
	G10	.607**	0.034
	G11	.789**	.176*
	G12	-.445-**	-.101-
	G13	.777**	0.121
	G14	.755**	.212*

\*\* Correlation is significant at the 0.01 level (2-tailed).

\*Correlation is significant at the 0.05 level (2-tailed).

The results in Table (1) indicate that the correlation between the items and the total score was weak, while the correlation between the items and subscales was high which indicates high construct validity. The correlation ranged between (.303 - .725) for the fine motor sub-scale, (.218 - .545) for the self help sub-scale, (.202 - .726) for the receptive language sub-scale, (.384 - .624) for the expressive language sub-scale, (.254 - .729) for the gross motor sub-scale, (.236 - .623) for the social emotional sub-scale, and (.367 - .789) for the academic sub-scale. Thus, internal consistency is achieved for the scale in its whole form, except for four items which need to be replaced due to weak correlation. The scale has the required psychometric properties. For instance, in the area of validity, it was noticed that the significance of correlated validity for the domains of the scale were as follows: cognitive (0.79), physical (0.83), social (0.82), and total score for the scale (0.84).

The indicators of reliability were extracted in two ways: the scale's test-retest reliability, and the internal consistency reliability. The values of the coefficients of reliability for the test-retest ranged between (0.88-0.92) for the different domains, and (0.91) for the total mark. The coefficients of reliability for internal consistency using Cronbach's Alpha had values between (0.82-0.91) for the different domains, and (0.89) for the total mark on the scale. In addition, results of the Pearson Correlation between the two scales based on data gathered from a sample of 39 children was (.964), which indicates high concrete validity for the translated version of the PEDS:DM.

### Reliability Indicators

After testing the validity of the instrument, its reliability coefficient was checked through two steps:

- Internal consistency: This was measured according to Cronbach's Alpha, with a reliability coefficient of (.867), which indicates high reliability.
- Test-retest reliability: Using the scale twice in two weeks for 30 parents to measure the stability of characteristics, the results were (.946\*\*), indicating high reliability.

### Discussion

This pilot study aimed to evaluate the relevance, validity and reliability of the Jordanian version of the Parents Evaluation of Developmental Status: Developmental Milestones (PEDS:DM) for Jordanian children. Regarding reliability coefficients of the PEDS:DM, the study put forward several methods of evaluating reliability in data collection, as the reliability of the Jordanian version was checked using internal consistency and test-

retest reliability.

The study results indicated that the reliability coefficients were very high in all the methods used to check it, which is due to the accurate translation procedures, the clarity of the application instructions, and the level of global reliability the PEDS:DM incorporates. Moreover, several validity coefficients were evident in the Jordanian version of the PEDS:DM. The preliminary indicators for the validity were expressed through face validity, construct validity and concurrent validity. The Jordanian version of the PEDS:DM proved to have a strong correlation with a previously validated developmental measure, which further proved its validity. Finally, the correlation coefficient between the sub-scales forming the PEDS:DM, and the total score of the scale was high.

These results indicated concordance with the psycho-metry of the original PEDS:DM Manual, which showed a similar ability to reliably measure all items on the same scale consistently, and to produce stable test scores when administering the assessment on several occasions (Glascoe & Robertshaw, 2008). Moreover, these results support the findings of previous studies administered on the PEDS:DM including studies by Bedford, Walton and Ahn (2013) and Halle et al. (2011), which found the PEDS to compare well when reviewed next to other developmental assessments and measures.

## Conclusions

The purpose of this study was to obtain and provide an Arabic Jordanian version of the PEDS:DM that is culturally aligned with the Jordanian context and psychometrically valid and reliable. The validity of this Arabic version scale was checked by measuring the face validity and the construct validity. In addition, concurrent validity was measured by calculating the Pearson Correlation between the Arabic version of the PEDS:DM and the Preschool and Kindergarten Children's Performance scale (PKCPS), which was established and developed by Al-Batch (2001). The results indicate high concrete validity for the translated version of the PEDS:DM.

After testing the validity of the instrument, its reliability coefficient was checked through internal consistency and test-retest reliability. The findings indicate high reliability of the scale. Consequently, the Arabic Jordanian version of the PEDS:DM is psychometrically valid and reliable for the implementation in the Jordanian context. As a result, this instrument is recommended to be utilized by a variety of stakeholders who are interested in early intervention of children in the Jordanian early childhood settings. It can be useful for Arabic contexts that are similar to Jordanian context.

## References:

- Abu-Jaber, M., Al-Shawareb, A., & Gheith, E. (2010). Kindergarten teachers' beliefs toward developmentally appropriate practice in Jordan. *Early Childhood Education Journal*, 38(1), 65-74.
- Alade, A. J. & Buzzetto-More, N. (2006). Best practices in e-assessment. *Journal of Information Technology Education*, 5, 251-269. Retrieved on July 27, 2013 from: <http://www.jite.org/documents/Vol5/v5p251-269Buzzetto152.pdf>
- Al-Batch, M. (2001). Developing the preschool and kindergarten children's performance scale in Jordan. *Dirasat Journal*, 20, 5.
- Bagnato, S. J. & Neisworth, J. T. (1991). *Assessment for early intervention: Best practices for professionals*. New York: Guilford Press, Inc.
- Bagnato, S. J. & Neisworth, J. T. (1995). A national study of the social and treatment "invalidity" of intelligence testing for early intervention. *School Psychology Quarterly*, 9(2), 81-102.

- Bagnato, S. J. (2007). *Authentic assessment for early childhood intervention: Best practices*. New York, NY: Guilford Press, Inc.
- Bedford, H., Walton, S., & Ahn, J. (2013) *Measures of child development: A review*. London: UCL.
- Brewer, J. (2004). *Introduction to early childhood education: Preschool through primary grades*. (5<sup>th</sup> Edition). New York: Pearson Education, Inc.
- Coghlan, D., King, J. S., & Wake, M. (2003). Parents' evaluation of developmental
- Cox, J. E., Huntington, N., Saada, A., Epee-Bounya, A. & Schonwald, A. D. (2010). Developmental screening and parents' written comments: An added dimension to the Parents' Evaluation of Developmental Status questionnaire. *Pediatrics*, 126(Supplement 3), S170-S176.
- Dawson, P. & Guare, R. (2004). *Executive skills in children and adolescents: A practical guide to assessment and intervention*. New York: Guilford Press, Inc.
- Delaney, L. & Smith, J. (2012). Childhood health: Trends and consequences over the life-course. *The Future of Children*, 22(1), 43-63.
- Glascoe, F. P. & Dworkin, P. H. (1993). Obstacles to effective developmental surveillance: Errors in clinical reasoning. *Journal of Developmental Behavioural Pediatrics*, 14, 344-349.
- Glascoe, F. P. & Robertshaw, N. S. (2008). *PEDS: Developmental milestones. A tool for surveillance and screening*. Nolensville, TN: Ellsworth & Vandermeer Press, LLC.
- Glascoe, F. P. (2000). Evidence-based approach to developmental and behavioural surveillance using parents' concerns. *Child: Care, Health and Development*, 26(2), 137-149.
- Halle, T., Zaslow, M., Wessel, J., Moodie, S., & Darling-Churchill, K. (2011). Understanding and Choosing Assessments and Developmental Screeners for Young Children: Profiles of Selected Measures. Retrieved on March 20, 2016 from: <http://www.acf.hhs.gov/opre/resource/understanding-and-choosing-assessments-and-developmental-screeners-for>
- Kellough, R. D. & Kellough, N.G. (1999). *Secondary school teaching: A guide to methods and resources: Planning for competence*. Upper Saddle River, New Jersey Prentice Hall.
- Limbos, M. M. & Joyce, D. P. (2011). Comparison of the ASQ and PEDS in screening for developmental delay in primary care settings. *Journal of Developmental and Behavioral Pediatrics*, 32(7), 499-511.
- McCormick, M. C., Brooks-Gunn, J., Buka, S. L., Goldman, J., Yu, J., Salganik, M., Scott, D. T., Bennett, F. C., Kay, L. L., Bernbaum, J. C., Bauer, C. R., Martin, C., Woods, E. R., Martin, A., Casey, P. H. (2006). Early intervention in low birth weight premature infants: Results at 18 years of age for the Infant Health and Development Program. *Pediatrics* HYPERLINK "<http://www.ncbi.nlm.nih.gov/pubmed/16510657>", 117(3), 771-780.
- Neisworth, J. T. & Bagnato, S. J. (1992). The case against intelligence testing in early intervention. *Topics in Early Childhood Special Education*, 12(1), 1-20.
- Neisworth, J. T. & Bagnato, S. J. (2004). The mismeasure of young children: The authentic assessment alternative. *Infants and Young Children*, 17(3), 198 -212.
- Ricketts, J. (2006). Review of take a look: Observation and portfolio assessment in early childhood (3rd Edition). *Childhood Education*, 82 (3), 184. Retrieved from: [http://www.tandfonline.com/doi/abs/10.1080/00094056.2006.10521375#Uq3c\\_CfgEVwn](http://www.tandfonline.com/doi/abs/10.1080/00094056.2006.10521375#Uq3c_CfgEVwn) July 27, 2016
- Sices, L., Feudtner, C., McLaughlin, J., Drotar, D., & Williams, M. (2003). [How do primary care physicians identify young children with developmental delays? A national](#)

- survey. *Journal of developmental and behavioral paediatrics*, **24**, 409-417.
- Snow, C. E. (2008). *Early Childhood Assessment: Why, What, and How*. Washington, D.C.: National Academies Press.
- Spittle, A. J., Orton, J., Doyle, L. W., Boyd, R. (2007). Early developmental intervention programs post hospital discharge to prevent motor and cognitive impairments in preterm infants. *Cochrane Database of Systematic Reviews*, (2). doi: 10.1002/14651858.CD005495.pub2.
- status in the Australian day-care setting: Developmental concerns of parents and careers. *Journal of Pediatrics: Child Health*, **39**, 49-54.
- Thomas, J. (2016). Early Intervention. *Early Intervention: Research Starters Education*, 1-11.
- United Nations Children's Fund UNICEF (2003). *The state of the world's children 2003*. New York: UNICEF
- Wortham, S. C. (2008). *Assessment in early childhood education*. (5th Edition) Pearson Education, Inc.

## **An Evaluation of a Professional Development Programme in Functional Behavior Assessment for Educators in Australia**

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### **Abstract**

*The efficacy of delivering autism-focused Functional Behaviour Assessment (FBA) training within a six-session professional development (PD) framework was investigated with 23 Australian educators. FBA knowledge, self-efficacy (SE), and confidence were measured pre-to-post- PD series as markers of educator ability to address the challenging behaviours associated with Autism Spectrum Disorder (ASD). A significant relationship was found between confidence, SE, and overall performance in various aspects of the educator's job role. These results suggest that this form of PD may be used to train educators in the skills necessary to improve both their own working experience and their students' learning opportunities.*

**Keywords:** autism; Functional Behaviour Assessment; teaching; education; professional development; Self-Efficacy

## Introduction

The neurodevelopmental condition of Autism Spectrum Disorder (ASD) is characterised by pervasive impairments in social communication and reciprocal social interaction, plus rigid and repetitive behaviour, interests, and activities (APA, 2013). These impairments can have adverse social-emotional and academic repercussions on the daily functioning of the individual with ASD within a school setting, resulting in elevated levels of problem behaviours, social anxiety, academic disengagement, and higher rates of suspension and expulsion (Baker, Lane, Angley, & Young, 2008; Carter, Davis, Klin, & Volkmar, 2005; Macintosh & Dissanayake, 2006).

The prevalence of ASD has increased over twentyfold during the recent decades, with Australian figures indicating that between 1.1% of males and 0.3% of females have been diagnosed with an ASD (Australian Bureau of Statistics, 2017). This escalation in prevalence has resulted in a greater number of children with ASD in mainstream classrooms. Such children are highly likely to exhibit problem behaviours (Macintosh & Dissanayake, 2006), and are unlikely to respond to generic behavioural interventions because their behaviours are deemed severe and complex in nature (Matson & Shoemaker, 2009; Roth, 2010). This has led to increased interest in more specialised approaches for child behaviour management in the classroom based upon Functional Behaviour Assessment (FBA).

FBA focuses on the individual child's specific responses in addition to the contextual factors (ie, antecedents and consequences) which contribute to occurrence of their challenging behaviour in the classroom (Trussell, Lewis, & Stichter, 2008). As such, FBA is a systematic process for conceptualising challenging behaviours, and the underlying functions that predict and maintain such behaviours (Munk & Repp, 1994; Sugai et al., 2000). The intervention planning that follows the FBA process has proven successful when applied to the problem behaviours shown by many children with ASD (Lane, Oaks, & Germer, 2014), and its success in creating long-term and meaningful behaviour change has been linked to the FBA emphasis on identifying the purpose or function of the apparently 'illogical' or 'unpredictable' behaviour shown by some children with ASD (Fox & Conroy, 2000).

Applied FBA has been effectively employed with a diverse range of individuals in the school environment (Lane, Oakes, & Germer, 2014). For example, FBA-driven interventions have improved the behavioural outcomes of boys with behavioural adjustment difficulties (Lo & Cartledge, 2006), increased the rate of prosocial responses in children and adolescents with behavioural and emotional disorders (Hendrickson, Gable, Conroy, Fox, & Smith, 1999; Fox & Conroy, 2000), reduced classroom disturbances (Packenham, Shute, & Reid, 2004), been effective preventative measures for mild behavioural challenges (Scott & Caron, 2005), and produced positive behaviours (eg, hand-raising to ask questions or increased participation in classroom activities) in children with ASD (Hanley, 2012).

The education system in Australia is increasingly crediting applied FBA as being a respectful, client-focused method for promoting the development of prosocial behavioural interventions which acknowledge and address the functionality of the behaviour exhibited by school children with ASD (Bambara & Kern, 2005; Umbreit et al., 2007). FBA is currently a

recommended form of assessment for Australian schools to use in developing individual behavioural intervention plans as part of the third tier of the positive behaviour and intervention support (PBIS) framework. This framework incorporates FBA procedures within a larger whole-school reformation which aims to elicit proactive, prosocial, and positive responses in students.

However, there is some evidence to suggest that many educators who employ FBA do so in a partial or fragmented manner, with less than half of these educators applying the entire FBA process (O'Neill & Stephenson, 2010). Some of the factors that cause this truncation of the FBA process may include lack of time, poor awareness of FBA procedure and utility, and inappropriate training (O'Neill & Stephenson, 2010; Pithers & Soden, 1998). Moreover, even in instances where FBA training has been implemented, it has been suggested that its success in creating changes to educator-driven applications in the classroom is impacted by educator characteristics such as self-efficacy (SE), and self-confidence (SC) (Cooper, 2010; Meichtry & Smith, 2007). High levels of SE can increase standards of teaching behaviour, plus increase student motivation and achievement (Skaalvik & Skaalvik, 2007; Tschannen-Moran & Woolfolk-Hoy, 2001), whereas lower levels of SE in educators have been associated with self-doubt on content delivery, decreased utilisation of environmental and efficacious teaching strategies, and overall lower performance levels (Bandura, 1998). Self-confidence (SC) is another characteristic that can directly impinge on an individual's performance (Callingham & Watson, 2014). SC may be defined as an individual's self-reliance or definitive belief concerning some aspect of his/her performance (Kirkpatrick, 1983). SC is considered to be a more fluid construct than SE and may be more suited to measurement of specific learning variables associated with particular content areas (Meichtry & Smith, 2007; Callingham & Watson, 2014). The variables of SE and SC were targeted within the training program in the present study because SE represents the broad dynamic of perceived ability to deliver behavioural strategies and SC can directly impinge on educators' ability to deliver such strategies in the classroom context (Callingham & Watson, 2014).

### ***Aims of the study***

To determine if a six-session, eight-week FBA training programme developed for educators who taught and/or supported students with ASD within mainstream school settings could improve the educator's FBA knowledge, SE, and SC characteristics.

### **Methods**

#### ***Participants***

All mainstream state primary and high schools in the South-Eastern region of Education Queensland were contacted by the Centre for Autism Spectrum Disorder (C ASD) at Bond University via an email to Principals between 9am and 3pm. Interested teachers contacted the C ASD and participated in a brief telephone interview to ensure selection criteria were met. Twenty-three educators were selected on the basis of the following four criteria: (a) they must have been working directly with a student with ASD in a teaching and/or support capacity, (b) they must have reported that the ASD student exhibited challenging behaviour of sufficient intensity to interfere with learning engagement, (c) they must have previously attempted to apply a behavioural support plan that did not succeed in addressing the challenging behaviour, and (d) they would agree to actively implement best-practice FBA and subsequent FBA interventions to their chosen student's behaviour on a daily basis within the classroom context.

The sample (87% female, and 13% male) consisted of classroom educators (52%), Special Education staff (30%) Heads of Special Education (HOSES) (13%), and Deputy Principals (5%). Of the 23 participants, 18 were trained as primary school educators (78%) and five were trained as high school educators (22%). Participation in the present study contributed to the partial fulfilment for mandatory professional development (PD) hours in order to maintain registration with the Queensland College of Teachers.

## Instruments

### *FBA Knowledge*

The measure of FBA knowledge was developed by the first author and comprised 12-items about the participants' knowledge of FBA concepts and FBA-driven interventions. Three of the items represented statements that could be dichotomously scored as correct/incorrect. The remaining nine items tapped participants' understanding of the underpinning rationale for FBA data-collection and analysis procedures. These items required an open-ended short written response with two elements embedded therein, which were graded accordingly on a 0, 1 or 2 scale. The maximum for the totalled score on the FBA knowledge was 21. Items are shown in Table 1.

**Table 1. FBA knowledge items**

Item one	Functional Behaviour Assessment is used to investigate a number of factors which impact on student behaviour. Identify the factor which happens before the behaviour, is capable of triggering that behaviour, and can be directly observed by you.
Item two	Identify the feature which is not required in order for an operationalised behavioural definition to be developed.
Item three	Functional Behaviour Assessment is used to investigate a number of factors which can cause student behaviour to persist over time. Identify the factor which happens after the behaviour, is capable of helping the student cope with demand, and can be directly observed by you.
Item four	Briefly describe what a Functional Behaviour Assessment is.
Item five	Briefly explain the reason why a Functional Behaviour Assessment is usually conducted before developing interventions to manage the challenging behaviour of students.
Item six	Investigation of setting events is an important part of a Functional Behaviour Assessment. Briefly define this factor and give one example of a setting event which is particularly relevant to students with an ASD.
Item seven	Outline the advantages of collecting data on specific student behaviours during a Functional Behaviour Assessment. Give examples of two data-collection methods that can be used in the classroom to collect information on student behaviour.
Item eight	Once a Functional Behaviour Assessment has been completed, the data which have been collected on factors such as antecedents are often classified into themes or groups. Briefly explain the advantages of group different types of antecedents into themes.
Item nine	Briefly explain the reasons why Functional Behaviour Assessment focuses on identifying the functions of students' challenging behaviour. Give two examples of functions that relate to the behaviour of students with an ASD.
Item ten	Briefly explain why it is important to develop and test hypotheses about challenging behaviour during a Functional Behaviour Assessment.
Item eleven	Briefly state why it is important to include proactive changes to the learning environment as part of an intervention developed to change student behaviour. Give examples of two changes you would make in the classroom to promote positive responses from your student with an ASD.
Item twelve	Briefly explain how information gained on the functions of challenging behaviour (during a Functional Behaviour Assessment) can be used during an intervention. Give examples of two ways in which knowledge on functions can be used to promote positive responses from your student with an ASD.

### *Teacher Sense of Efficacy Scale*

Klassen and Ming Chui's (2010) 20-item Teacher Sense of Efficacy Scale (TSES), job satisfaction, and overall job stress, was used to assess SE. The TSES requires respondents to rate themselves on SE statements and job stress statements on a nine-point Likert scale, from 1 indicating "nothing", to 9 indicating "a great deal" (Fives & Buehl, 2008). The SE and job stress statement ratings were combined and totalled. Tschannen-Moran and Woolfolk-Hoy's (2001) reported satisfactory validity and reliability for the TSES.

### *Self Confidence*

The SC measure employed in this study was designed to assess the participants' beliefs concerning their capacity to deliver curriculum and support to students with ASD exhibiting challenging behaviour. Ten items were designed by a collaborative group of clinician-researchers who had extensive experience in remediating challenging behaviours in an educational context (see Appendix A). Each item assessed a different facet of educator confidence in their capacity to instruct and support a student with ASD on a daily basis. Educators responded to items via a scale of ratings ranging from zero to 100 (zero = "not confident", and 100 = "extremely confident").

### **Procedure**

Following recruitment, participants were asked to complete a Pre-Training Survey consisting of the knowledge of FBA scale, the TSES, and the SC measure described above, one week prior to commencing their FBA training. They then participated in the training programme and completed a Post-Training Survey one week after the eight weeks of the programme. Of the 23 participants, 22 completed all pre- and post-training self-reporting requirements. The remaining individual did not complete the FBA measure post-training questionnaire. Ethical approval for this study was given by the Bond University Human Research Ethics Committee.

### *Training Schedule*

As described above, the six-session training programme was presented over eight-weeks, with sessions one to four delivered weekly, and sessions five and six given on a fortnightly basis. The one-week break between sessions four, five, and six was designed to provide participants with the opportunity to apply their newly gained FBA skills independently within the school setting with coaching available from training staff if/when required.

### *Training Procedure*

Training was created to comply with best-practice recommendations from the research on FBA in both laboratory (Hanley, 2012) and school settings (Lo & Cartledge, 2006). To this end, the training focused on *data-collection*, *data-analysis*, plus additional *FBA-driven intervention planning and monitoring* phases of FBA. The *data-collection* process used in the course focused on direct observation plus recording of behaviour and its precursor and maintaining variables. This process also included training the educators to complete rating scales and undertake interviews as indirect data collection methods. *Data analysis* involved clustering of data to produce themes that allowed for hypotheses on precursor-behaviour and behaviour-function relationships. *FBA-driven intervention planning and monitoring* reviewed the traditional and applied models for FBA and refined these to

ensure that training content, practice activities, and data-collection materials that participants were to apply in their classrooms were applicable within a classroom context and sufficiently structured and comprehensible so as to avoid creating disruption to the everyday responsibilities of the educator participants or their students.

### **Statistical Analyses**

The Statistical Packages for the Social Sciences (SPSS) version 23 was used to perform a repeated measures multivariate analysis of variance (RM-MANOVA) to ascertain change in FBA knowledge, SE, and SC over the period of the training. Pearson product correlations were used to gauge pre- and post-training relationships between FBA knowledge, SE, and SC. Listwise deletion was employed to account for missing data. Assumption testing revealed no violation. The alpha level of significance was set at 0.05.

### **Results**

#### *Pre-to-post training differences*

Table 2 shows the participants' mean pre- and post-training scores for SE, SC, and FBA knowledge.

**Table 2. Pre- and post- training series descriptive statistics for SE, SC, and FBA knowledge**

		<i>n</i>	<i>M</i>	<i>SD</i>
Pre- FBA training	SE	23	131.91	12.54
	SC	23	62.30	12.09
	FBA Knowledge	22	5.91	2.33
Post- FBA training	SE	23	139.61	14.73
	SC	23	73.61	1.54
	FBA knowledge	22	12.73	2.77

A significant omnibus effect was found for the MANOVA ( $F(1, 21) = 1584.86, p < .001$ , partial  $\eta^2 = .98$ ). There were significant univariate increases in FBA knowledge ( $F(1, 21) = 61.49, p < .001$ , partial  $\eta^2 = .75$ ), educator SE ( $F(1, 21) = 6.52, p = .018$ , partial  $\eta^2 = .24$ ), and SC ( $F(1, 21) = 28.16, p < .001$ , partial  $\eta^2 = .54$ ) from pre- to post-test.

### **Pre- and Post- Training Relationships**

Pearson product moment correlations were conducted between the independent variables of SE, SC, and FBA knowledge to determine the degree of relationship between the variables. Significant relationships were detected between pre-training measures of educator SE and SC ( $r(21) = .61, p = .002$ ), and post-training measures of SE and SC ( $r(21) = .52, p = .01$ ). FBA knowledge was not significantly related to SE or SC.

## Discussion

These results provide initial evidence for the efficacy of using PD as a method of delivering FBA training to educators, and also showed that a six-session, eight-week training course may be sufficient in facilitating significant FBA knowledge gains.

The pre- to post-training change in FBA knowledge found here is congruent with recent data from another study which recorded similar increases in FBA knowledge pre- and post- PD FBA training offered in the USA (Lane et al., 2014). However, that study differs from the present one in terms of location and duration of professional development training because Lane et al.'s (2014) training series spanned a year, in contrast to the eight-week timeframe employed in this study. The eight-week timespan of this study was a result of the need to fit within the time and activity demands that these educators experienced. This study supports the utility of the educator's mandatory PD hours as an appropriate training arena for FBA processes and subsequent FBA intervention design, and suggests that a very long training period (e.g., one year) may not be required to obtain significant improvements in participants' FBA knowledge.

The significant change in educator SE and SC pre- to post-training suggests that, not only did the FBA training positively impact educators' SE, but also that significant positive changes in educator SE and confidence relating to FBA were made in a relatively short time. This finding is congruent with that reported by Dierking & Fox (2013), who found that advancing educators' knowledge base built their sense of confidence and promoted self-empowerment.

This finding is also of note because it may directly translate to educator effectiveness (Dierking & Fox, 2013; McBer, 2001; Ross, 1994; Sandhultz & Ringstaff, 2014). Thus, effective utilisation of FBA may be an important tool in bolstering the internal characteristics of SC and SE in educators to address challenging behaviours of those within their classroom. Correlations between the variables of educator SE and SC pre- and post- training suggest that eliciting changes in one aspect of training (e.g., a programme aimed at improving confidence) may likewise elicit changes in another aspect of educator activity.

Limitations within this study include the sample size, and the use of FBA knowledge gains as the overall measure of FBA utility. Although the significant FBA knowledge gains identified in this study signified a promising beginning for the educators and for PD training series model, generalisation to actual behaviour change by students in the educators' classrooms is the gold standard of efficacy of training programmes such as this one. Future research should focus upon theoretical and applied knowledge gains via the measurement of FBA knowledge and the success of the FBA model application. Additionally, future research may follow up the relationship found between SE, SC, and FBA to ascertain if the immediate effectiveness of the training programme was maintained over time.

In conclusion, this study pioneered the presentation of FBA to Australian educators in a professional development setting to improve the educator's FBA knowledge, SE and SC. Results signified that this is a promising avenue to deliver meaningful FBA training within a short training period and that it may have spin-off effects on SC and SE.

**References:**

- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.
- Australian Bureau of Statistics. (2017). *Disability, Ageing and Carers, Australia: Summary of Findings, 2015*. Retrieved from <http://www.abs.gov.au/ausstats/abs@.nsf/Latestproducts/4430.0Main%20Features752015?opendocument> HYPERLINK "[http://www.abs.gov.au/ausstats/abs@.nsf/Latestproducts/4430.0Main%20Features752015?opendocument&tabname=Summary&prodno=4430.0&issue=2015&num=&view="](http://www.abs.gov.au/ausstats/abs@.nsf/Latestproducts/4430.0Main%20Features752015?opendocument&tabname=Summary&prodno=4430.0&issue=2015&num=&view=) HYPERLINK
- Baker, A. E., Lane, A., Angley, M. T., & Young, R. L. (2008). The relationship between sensory processing patterns and behavioural responsiveness in autistic disorder: A pilot study. *Journal of Autism and Developmental Disorders*, 38(5), 867-875. doi: 10.1007/s10803-007-0459-0
- Bambara, L. M., & Kern, L. (Eds.). (2005). *Individualized supports for students with problem behaviors: Designing positive behavior plans*. New York, NY: Guilford Press.
- Bandura, A. (1998). Personal and collective efficacy in human adaptation and change. *Advances in Psychological Science*, 1, 51-71.
- Boyle, G. J., Borg, M. G., Falzon, J. M., & Baglioni Jr, A. J. (1995). A structural model of the dimensions of teacher stress. *British Journal of Educational Psychology*, 65(1), 49-67.
- Callingham, R., & Watson, J. (2014, July). *Teachers' confidence in teaching statistical ideas*. Paper presented at the Ninth International Conference on Teaching Statistics, Flagstaff, AZ.
- Campbell-Sills, L., & Stein, M. B. (2007). Psychometric analysis and refinement of the Connor-Davidson Resilience Scale (CD-RISC): Validation of a 10-item measure of resilience. *Journal of Traumatic Stress*, 20(6), 1019-1028. doi: 35400016269095.0100
- Caprara, G. V., Barbaranelli, C., Borgogni, L., & Steca, P. (2003). Efficacy beliefs as determinants of teachers' job satisfaction. *Journal of Educational Psychology*, 95(4), 821. doi: 10.1037/0022-0663.95.4.821
- Carter, A. S., Davis, N. O., Klin, A., & Volkmar, F. R. (2005). Social development in autism. In F. R. Volkmar, R. Paul, A. Klin, & D. Cohen (Eds.), *Handbook of autism and pervasive developmental disorders* (pp. 312-334). Hoboken, NJ: John Wiley & Sons, Inc.
- Chaplain, R. P. (2008). Stress and psychological distress among trainee secondary teachers in England. *Educational Psychology*, 28(2), 195-209. doi: 10.1080/01443410701491858
- Connor, K. M., & Davidson, J. R. (2003). Development of a new resilience scale: The Connor-Davidson resilience scale (CD-RISC). *Depression and Anxiety*, 18(2), 76-82. doi: 10.1002/da.10113
- Cooper, P. (2011). Teacher strategies for effective intervention with students presenting social, emotional and behavioural difficulties: An international review. *European Journal of Special Needs Education*, 26(1), 71-86. doi: [10.1080/08856257.2011.543547](https://doi.org/10.1080/08856257.2011.543547)

- Day, C. W., Stobart, G., Sammons, P., Kington, A., Gu, Q., Smees, R., et al. (2006). *Variations in Teachers' Work, Lives and Effectiveness* (Report No. 743). Nottingham: Crown Copyright.
- Dierking, R. C., & Fox, R. F. (2013). "Changing the way I teach": Building teacher knowledge, confidence, and autonomy. *Journal of Teacher Education*, 64(2), 129-144. doi: 10.1177/0022487112462893
- Fives, H., & Buehl, M. M. (2008). What do teachers believe? Developing a framework for examining beliefs about teacher's knowledge and ability. *Contemporary Educational Psychology*, 33(2), 134-176. doi:10.1016/j.cedpsych.2008.01.001
- Forlin, C. (2001). Inclusion: Identifying potential stressors for regular class teachers. *Educational Research*, 43(3), 235-245. doi: 10.1080/00131880110081017
- Fox, J. J., & Conroy, M. A. (2000). FBA for children and youth with emotional-behavioral disorders: Where we should go in the twenty-first century. *Preventing School Failure*, 44(4), 140-141. doi: 10.1080/10459880009599796
- Gibson, S., & Dembo, M. H. (1984). Teacher efficacy: A construct validation. *Journal of Educational Psychology*, 76(4), 569-582. doi: 10.1037/0022-0663.76.4.569
- Gu, Q., & Day, C. (2007). Teachers resilience: A necessary condition for effectiveness. *Teaching and Teacher education*, 23(8), 1302-1316.
- Hanley, G. P. (2012). Functional assessment of problem behavior: Dispelling myths, overcoming implementation obstacles, and developing new lore. *Behavior Analysis in Practice*, 5, 54–72. doi i1998-1929-5-1-54.pdf
- Hargreaves, A. (2000). Mixed emotions: Teacher's perceptions of their interactions with students. *Teaching and Teacher Education*, 16(8), 811-826. doi:10.1016/S0742-051X(00)00028-7
- Hargreaves, A., & Fink, D. (2006). The Ripple Effect. *Educational Leadership*, 63(8), 16-20.
- Henderson, N., & Milstein, M. M. (2003). *Resiliency in schools: Making it happen for students and educators*. London, UK: Corwin Press.
- Hendrickson, J. M., Gable, R. A., Conroy, M. A., Fox, J., & Smith, C. (1999). Behavioral problems in schools: Ways to encourage functional behavior assessment (FBA) of discipline-evoking behavior of students with emotional and/or behavioral disorders (EBD). *Education and Treatment of Children*, 22, 280-290. doi: <http://www.jstor.org/stable/42899575>
- Iwata, B.A., Dorsey, M., Slifer, K.J., Bauman, K.E., & Richman, G.S. (1982). Toward a functional analysis of self-injury. *Analysis and Intervention in Developmental Disabilities*, 2, 1-20.
- Klassen, R. M., Bong, M., Usher, E. L., Chong, W. H., Huan, V. S., Wong, I. Y., & Georgiou, T. (2009). Exploring the validity of a teacher's self-efficacy scale in five countries. *Contemporary Educational Psychology*, 34(1), 67-76. doi: 10.1016/j.cedpsych.2008.08.001
- Klassen, R. M., & Chiu, M. M. (2010). Effects on teacher's self-efficacy and job satisfaction: Teacher gender, years of experience, and job stress. *Journal of Educational Psychology*, 102(3), 741-756. doi: 10.1037/a0019237

- Kogan, M., Blumberg, S., Schieve, L., Boyle, C., Perrin, J., Ghandour, R., . . & van Dyc, P. (2009). Prevalence of parent-reported diagnosis of autism spectrum disorder among children in the US, 2007. *Pediatrics*, 124 (5), 1395-1403. doi:10.1542/peds.2009-1522
- Lane, K. L., Oakes, W. P., & Germer, K. (2014). Outcomes of a practice- based professional-development training of functional assessment-based interventions: From knowledge acquisition to application. *Manuscript in preparation*
- Lo, Y. Y., & Cartledge, G. (2006). FBA and BIP: Increasing the behavior adjustment of African American boys in schools. *Behavioral Disorders*, 31(2), 147-161. Retrieved from <http://www.jstor.org/stable/23890481>
- Macintosh, K., & Dissanayake, C. (2006). Social skills and problem behaviours in school aged children with high-functioning autism and Asperger's disorder. *Journal of Autism and Developmental Disorders*, 36(8), 1065-1076. doi: 10.1007/s10803-006-0139-5
- Manthei, R., Gilmore, A., Tuck, B., & Adair, V. (1996). Teacher stress in intermediate schools. *Educational Research*, 38(1), 3-19. doi: 10.1080/0013188960380101
- Matson, J. L., & Shoemaker, M. (2009). Intellectual disability and its relationship to autism spectrum disorders. *Research in Developmental Disabilities*, 30(6), 1107-1114. doi:[10.1016/j.ridd.2009.06.003](https://doi.org/10.1016/j.ridd.2009.06.003)
- McBer, H. (2001). Research into teacher effectiveness. In F. Banks, & A. S. Mayes (Eds.), *Early professional development of educators* (pp. 193-209). London: David Fulton Publishers, Ltd.
- Meyer, R.E. (1987). *Educational Psychology: A Cognitive Approach*. New York, NY: Harper Collins.
- Meichtry, Y., & Smith, J. (2007). The impact of a place-based professional development programme on educators' confidence, attitudes, and classroom practices. *The Journal of Environmental Education*, 38(2), 15-32. doi: 10.3200/JOEE.38.1.15-34
- Meijer, C. J. W., & Foster, S. F. (1988). The effect of educator self-efficacy on referral chance. *The Journal of Special Education*, 22(3), 378-385. doi: 10.1177/002246698802200309
- Moyé, L. A. (2003). *Multiple analyses in clinical trials: fundamentals for investigators*. Springer Science & Business Media.
- Munk, D. D., & Repp, A. C. (1994). The relationship between instructional variables and problem behavior: A review. *Exceptional Children*, 60(5), 390-401. doi: 10.1177/001440299406000502
- O'Neill, S., & Stephenson, J. (2010). The use of Functional Behavioural Assessment for students with challenging behaviours: Current patterns and experience of Australian practitioners. *Australian Journal of Educational & Developmental Psychology*, 10, 65-82.
- Packenham, M., Shute, R., Shute, R., & Reid, R. (2004). A truncated functional behavioral assessment procedure for children with disruptive classroom behaviors. *Education and Treatment of Children*, 9-25. doi: <http://www.jstor.org/stable/42899781>

- Pithers, R. T., & Soden, R. (1998). Scottish and Australian teacher stress and strain: A comparative study. *British Journal of Educational Psychology*, 68(2), 269-279. doi: 10.1111/j.2044-8279.1998.tb01289.x
- Ross, J. A. (1994). *Beliefs that make a difference: The origins and impacts of teacher efficacy*. Paper presented at the Annual Meeting of the Canadian Association for Curriculum Studies, Calgary, Alberta, Canada. Retrieved from <http://files.eric.ed.gov/fulltext/ED379216.pdf>
- Roth, I. (2010). *The Autism Spectrum in the 21st Century: Exploring Psychology, Biology and Practice*. London: UK. Jessica Kinsley Publishing.
- Sandholtz, J. H., & Ringstaff, C. (2014). Inspiring instructional change in elementary school science: The relationship between enhanced self-efficacy and teacher practices. *Journal of Science Teacher Education*, 25(6), 729-751. doi: 10.1007/s10972-014-9393-0
- Scott, T. M., & Caron, D. B. (2005). Conceptualizing functional behavior assessment as prevention practice within positive behavior support systems. *Preventing School Failure: Alternative Education for Children and Youth*, 50(1), 13-20. doi: 10.3200/PSFL.50.1.13-20
- Skaalvik, E. M., & Skaalvik, S. (2007). Dimensions of educator self-efficacy and relations with strain factors, perceived collective educator efficacy, and educator burnout. *Journal of Educational Psychology*, 99(3), 611-625. doi: 10.1037/0022-0663.99.3.611
- Stichter, J. P., Sasso, G. M., & Jolivette, K. (2004). Structural analysis and intervention in a school setting: Effects on problem behavior for a student with an emotional/behavioral disorder. *Journal of Positive Behavior Interventions*, 6, 166-177.
- Sugai, G., Horner, R. H., Dunlap, G., Hieneman, M., Lewis, T. J., Nelson, C. M., ... & Ruef, M. (2000). Applying positive behavior support and functional behavioral assessment in schools. *Journal of Positive Behavior Interventions*, 2(3), 131-143. Retrieved from <http://files.eric.ed.gov/fulltext/ED443244.pdf>
- Trussell, R. P., Lewis, T. J., & Stichter, J. P. (2008). The impact of targeted classroom interventions and function-based behavior interventions on problem behaviors of students with emotional/behavioral disorders. *Behavioral Disorders*, 153-166. Retrieved from <http://www.jstor.org/stable/43153449>
- Tschannen-Moran, M., & Woolfolk Hoy, A. (2001). Educator efficacy: Capturing an elusive construct. *Teaching and Educator Education*, 17, 783-805.
- Umbreit, J., Ferro, J., Liaupsin, C., & Lane, K. L. (2007). *Functional behavioral assessment and function-based intervention: An effective, practical approach*. Upper Saddle River, NJ: Pearson.
- Yost, D. S. (2006). Reflection and self-efficacy: Enhancing the retention of qualified teachers from a teacher education perspective. *Teacher Education Quarterly*, 33(4), 59-76.

**Appendix A**

## Measure of confidence to remediate challenging behaviour of a student with an ASD

- How able are you to help your students with an ASD to make transitions without risking the onset of challenging behaviour?
- How able are you to advocate for the emotional and socio-emotional needs of student with an ASD in your school?
- How able are you to identify the functions of the challenging behaviour students with an ASD engage in?
- How able are you to identify the antecedents which might make students with an ASD vulnerable to using a challenging behaviour?
- How able are you to identify the low-level behaviours which indicate that students with an ASD are becoming anxious?
- How able are you to identify the general environmental factors that might cause students with an ASD to become confused and disengaged from learning?
- How able are you to help parents to apply the intervention strategies you use at school to manage their child's behaviour at home?
- How able are you to incorporate the data collection and data interpretation techniques you have learned in your daily teaching practice?
- How able are you to use data you collect to plan environments and tasks that support the specific needs of students with an ASD?
- How able are you to access support/resources from within your school to deliver optimal learning and support for your student with an ASD?

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