UNIVERSITY of INDIANAPOLIS®

School of Occupational Therapy

Using Handwriting to Promote Interdisciplinary Collaboration

Melanie Browne

May, 2018

A capstone project submitted in partial fulfillment for the requirements of the Doctor of Occupational Therapy degree from the University of Indianapolis, School of Occupational Therapy.

Under the direction of the faculty capstone advisor:

Taylor McGann, OTR, MS, OTD

A Capstone Project Entitled

Using Handwriting to Promote Interdisciplinary Collaboration

Submitted to the School of Occupational Therapy at University of Indianapolis in partial fulfillment for the requirements of the Doctor of Occupational Therapy degree.

By

Melanie Browne

OTS

Approved by:

Faculty Capstone Advisor	**Date**
Doctoral Capstone Coordinator	**Date**

Accepted on this date by the Chair of the School of Occupational Therapy:

Chair, School of Occupational Therapy	**Date**

Using Handwriting to Promote Interdisciplinary Collaboration

Melanie Browne

University of Indianapolis

Abstract

The purpose of this doctoral capstone experience was to effectively promote interdisciplinary collaboration between occupational therapy (OT) and applied behavior analysis (ABA) staff at the participating outpatient ABA center. A needs assessment revealed that staff felt the site could benefit from the creation of a standardized handwriting program to utilize with clients. The establishment and implementation of a handwriting program provided the media through which interdisciplinary collaboration occurred. Staff completed a pre- and post-implementation survey to rate their confidence and test their overall knowledge with scoring handwriting based on the established program criteria. An in-service was provided to all staff explaining the benefits of handwriting, how to utilize the data sheets and measuring tool to score and record clients' handwriting data, and OT's role in handwriting. The program was implemented with ten clients at the participating site through one-on-one consultation between the behavior technicians and the occupational therapy student. The results from the surveys showed that staff's knowledge and confidence improved with scoring and implementing handwriting programs. ABA staff expressed that the implementation of the handwriting program helped increase their confidence with handwriting, their understanding of OT, and their likelihood of collaborating with occupational therapists in the future.

Using Handwriting to Promote Interdisciplinary Collaboration

The World Health Organization (WHO) defines collaborative practice as occurring "when multiple health workers from different professional backgrounds provide comprehensive services by working with patients, their families, carers, and communities to deliver the highest quality of care across settings" (WHO, 2010, p. 13). By using an interprofessional or interdisciplinary approach to practice, occupational therapy practitioners can work with other healthcare workers to reach a common goal. Interdisciplinary practice will allow for overall better health outcomes and help combat the complex health challenges our world faces today (WHO, 2010). With the passing of the Patient Protection and Affordable Care Act of 2010, there has been a push to create new models of interdisciplinary practice to promote patient-centered care (Moyers & Metzler, 2014). There are multiple attributes which contribute to creating effective collaboration models such as: open communication, negotiation, assertiveness, lack of a hierarchy, and a shared base of knowledge (Fewster-Thuente & Velsor-Friedrich, 2008). Some barriers that prohibit effective collaboration include: "patriarchal relationships, time, gender, culture, and lack of role clarification" (Fewster-Thuente & Velsor-Friedrich, 2008, p. 42). If these barriers exist, it will be hard for a team to set and obtain goals. It is vital to determine ways to limit these barriers to have successful collaboration in the workplace.

The purpose of this doctoral capstone experience was to increase the interdisciplinary collaboration between occupational therapy (OT) and applied behavior analysis (ABA), specifically regarding handwriting implementation, at the participating ABA center. The OT student created a handwriting program including how to score and progress a client's writing as well as data sheets and a measuring tool to collect and score data.

Literature Review

With the increasing complexity of health problems, it is imperative that healthcare professionals work interdependently rather than independently (D'Amour, Ferrada-Videla, San Martin-Rodriguez, & Beaulieu, 2005). D'Amour et al. (2005) found that for a team-based approach to be effective, all members must understand each other's roles to maximize team collaboration. Currently in the education system for healthcare professionals, each discipline learns the frameworks that drive their work and create their scope of practice (D'Amour et al., 2005). However, to create a partnership between disciplines, educational systems need to break away from this traditional approach and implement a sense of collaboration rather than competition (D'Amour et al., 2005). There is presently a push to reshape current healthcare education curricula to be more interprofessional to bridge the gap between professions (Moyers & Metzler, 2014; WHO, 2010). The hope is that this will prepare future practitioners to be more collaborative and use a team-based approach in practice (Moyers & Metzler, 2014; WHO, 2010).

After a systematic review of the literature, D'Amour et al. (2005) found the common concepts related to effective collaboration are sharing, creating a partnership, being interdependent, and understanding the power relationship. Sharing refers to the shared responsibilities disciplines have with planning, conducting interventions, and data collection. The collaborative partnership that is created should have common goals and desires to reach clients' needs and have a shared power source between individuals (D'Amour et al., 2005). The authors in this study also found that collaboration is a dynamic and ever-changing process. Overall, this shows that collaboration is an evolving process that changes over time and with the input of all the disciplines involved (D'Amour et al., 2005).

One type of collaboration team is an interdisciplinary team, which "involves an effort to integrate and translate, at least to some degree, themes and schemes shared by several professions" (D'Amour et al., 2005, p. 120). This type of team follows a common goal, often to achieve positive health outcomes for clients, and attempts to also integrate the knowledge and expertise of everyone (D'Amour et al., 2005; Fewster-Thuente & Velsor-Friedrich, 2008). It is important to integrate "the knowledge and expertise of each professional" to create effective interdisciplinary collaboration (D'Amour, 2005, p. 120). Establishing this type of team creates a flexible and open environment for professionals to work. One challenge that professionals must overcome for this type of team to be effective is breaking down existing territories to best address their clients' needs (D'Amour et al., 2005).

An example of interdisciplinary collaboration is the relationship between occupational therapists and ABA professionals when working with individuals with autism spectrum disorder (ASD). OT and ABA services are two of the most frequently used services for individuals, especially children, with ASD (Welch & Polatajko, 2016). OT is defined as "the therapeutic use of everyday life activities (occupations) with individuals or groups for the purpose of enhancing or enabling participation in roles, habits, routines, and rituals in home, school, workplace, community, and other settings" (American Occupational Therapy Association [AOTA], 2014, p. S1). Whereas, ABA "focuses on modifying human behavior to further improve quality of life" (Schroeder, Lynch, & Turgeon, 2017). ABA therapy is commonly used to decrease problem behavior, increase language and communication skills as well as "improve attention, focus, social skills, memory, and academics" (Autism Speaks, 2012, p. 2). In ABA, these goals are typically achieved by using positive reinforcement for desired or socially acceptable behavior, in hopes that the rewarded behavior or skill will be repeated (Autism Speaks, 2012). Although OT

and ABA can address overlying areas of function, there is a lack of evidence to support the collaboration between these disciplines (Brodhead, 2015; Schroeder et al., 2017; Welch & Polatajko, 2016).

Using an interdisciplinary approach for individuals with ASD involves determining the various strengths of multiple disciplines and combining them to increase client outcomes. This approach would create a well-rounded treatment plan to best meet clients' individual needs (Brodhead, 2015). Similar to D'Amour et al (2005), Schroeder et al. (2017) found common themes regarding successful collaboration between OT and ABA to include: "effective communication, motivated team members and leaders, and data collection" (p. 30). In addition, Welch and Polatajko (2016) believe that ABA and OT are compatible in that they both address similar areas and could work well together to reach shared goals, and in turn, enhance client outcomes. The areas that both disciplines have in common include: using a strengths-based approach, analyzing the environment, stressing the importance of a collaborative approach to treatment, and promoting growth in the areas of work, self-care, play, leisure, and social skills (Welch & Polatajko, 2016). Even though both professions stress a collaborative approach, it is not always carried out in practice (Welch & Polatajko, 2016). ABA professionals typically target the above skills by teaching them through the use of multiple trials and reinforcement to advance a client toward mastery (Autism Speaks, 2012). On the other hand, occupational therapists are trained to assess and address the specific performance skills and patterns impacting these areas. With this training, occupational therapists can use consultative techniques to work collaboratively with ABA professionals to reach the desired goals for each client (Welch & Polatajko, 2016).

Handwriting is an area where OT and ABA can collaborate to reach communication and

educational goals for children and impact their performance in other academic areas as well (Carlson, McLaughlin, Derby, & Blecher, 2009; Case-Smith & O'Brien, 2015). These goals are pertinent to, and addressed by, both OT and ABA professionals (AOTA, 2014; Autism Speaks, 2012). ABA professionals are trained to teach new skills, which can include handwriting, but they do not have the clinical expertise to understand the underlying performance skills impacting handwriting (Welch & Polatajko, 2016). However, occupational therapists are trained to evaluate clients' specific handwriting challenges, determine which factors are impacting their skills, and implement ways to improve their handwriting either through direct intervention or consultation with other disciplines (Case-Smith & O'Brien, 2015). Since ABA professionals do not analyze the underlying performance skills and patterns, they could benefit greatly from interdisciplinary collaboration with an occupational therapist to identify a client's specific handwriting needs and consult on how to address these needs within their ABA programming.

A commonly used handwriting program for developing prewriting and writing skills is Handwriting Without Tears (HWT). HWT was developed by an occupational therapist for children of all ages, abilities, and learning styles, and includes multisensory and developmentally-appropriate activities to promote increased prewriting and handwriting skills (Case-Smith & O'Brien, 2015; Olsen & Knapton, 2015). The program promotes the developmental progression of writing by taking a child from a no-paper, no-pencil approach to imitation and copying to independent writing of letters. It focuses on using simple vertical and horizontal lines to form letters and groups letters of similar difficulty together to increase success in writing (Olsen & Knapton, 2015; Roberts, Derkach-Ferguson, Siever, & Rose, 2014).

Multiple studies have examined the effectiveness of HWT with children with ASD. Overall, the studies have found that HWT can help increase clients' ability to write specific

letters, increase legibility, and increase the ability to write their names (Carlson et al., 2009; Cosby, McLaughlin, & Derby, 2009; Coussen, McLaughlin, Derby, & McKenzie, 2012; McBride et al., 2009). It should be noted that there is limited research as to what qualifies as "legible," other than if the letter can be identified as the appropriate capital letter, it has all the required parts, and is not rotated or reversed (Carlson et al., 2009; Cosby et al., 2009; Coussen et al., 2012; Roberts et al., 2014). This is an area where further research is needed since legibility is very subjective and based on the observer's opinion. Therefore, research could benefit from identifying objective ways to score/collect handwriting data, specifically when using HWT. In addition, one major component of ABA therapy is data collection, which is used to measure a client's progress to obtaining a certain skill (Autism Speaks, 2012). If an occupational therapist wishes to consult with an ABA professional and add handwriting as a target within the client's program, he/she would benefit from finding objective ways to measure the client's writing.

Overall, there is a major push in healthcare to use interdisciplinary collaboration to help reach client goals. The collaboration consists of many factors to be effective, but with time and persistence it can help increase client outcomes. There are many benefits to this type of collaboration, however there is limited research on the specific use of interdisciplinary collaboration between OT and ABA for individuals with ASD. Differing viewpoints exist between the two disciplines with how to best reach goals when working with individuals with ASD, but there are commonalities they can pull from to achieve holistic service delivery. In handwriting programs, occupational therapists can consult with ABA professionals to assist clients in increasing their prewriting and handwriting skills and in turn help meet their overall communication and academic goals. To address this gap, this capstone experience included consultation with ABA professionals on the most effective way to implement the handwriting

program to make sure the clients are on track to meet their handwriting goals. This allowed the ABA center to have a standard way to teach, score, and collect data on handwriting, based on the HWT program.

Theoretical Basis

The theory that guided this project was the Person-Environment-Occupation (PEO) model. The focus of this model is to maximize the PEO fit, which is the continual interaction between the person, environment, and occupation (Law et al., 1996). The better the fit or overlap of the three factors, the better the occupational performance. The PEO fit changes over a person's lifetime as their occupational performance changes (Law et al., 1996). In this model, change is constantly occurring and as one aspect changes, so do the others (Law et al., 1996). When creating and implementing the handwriting program, all three factors were taken into consideration and how they were continually influencing each other. As clients worked to improve their occupation of handwriting, the environment and people, including clients and staff, all impacted the clients' occupational performance. It was critical to make sure the staff were teaching and scoring handwriting correctly while at the same time providing the clients with the most beneficial learning environment. By doing so, the site could reach its optimal PEO fit.

The frame of reference that guided this project was the lifespan frame. This frame of reference focuses on helping people establish or restore age-appropriate occupations (Cole & Tufano, 2008). The main occupation that was addressed through this project is education, specifically handwriting. This included training ABA professionals on how to address the performance skills and patterns regarding the clients handwriting and how to help the them establish age-appropriate handwriting skills. In the lifespan frame of reference, change occurs through learning new skills and motivation comes from an individual's need for mastery (Cole &

Tufano, 2008). During this experience, consultation with ABA professionals occurred including how to help teach the clients new handwriting skills and how to motivate them to obtain these skills. It was important to take into consideration the motivation and comprehension of the staff as well to increase the carryover of the program.

Screening and Evaluation

The spring before starting my capstone experience I met with my site mentor, who is the head occupational therapist at the participating ABA center to discuss possible program development ideas. We discussed several ideas including creating a handwriting program, making a video library to educate on OT and how to use various strategies in the ABA programs, and developing an education binder for staff about the importance of various OT topics such as tooth brushing, dressing, and feeding (A. Seal, personal communication, 2017). However, when meeting the month before starting, she emphasized that creating a standardized handwriting program was of high importance to her and the site. She explained that she wanted a protocol created for handwriting based on HWT that included designing a measuring tool to score clients' handwriting, developing data sheets to collect progress, and setting the criteria to advance through the program (A. Seal, personal communication, 2018).

Prior to creating the handwriting protocol, I conducted a needs assessment to understand how handwriting programs are currently carried out at the site as well as potential areas for improvement. One aspect of the needs assessment included informal interviews with various staff members including my site mentor, Board Certified Behavior Analysts (BCBAs), who write the clients' ABA programs, and behavior technicians, who implement the clients' programs. While interviewing the behavior technicians, I observed how they currently carry out handwriting programs with clients. I noticed there was a lack of consistency between clients'

handwriting programs regarding what was expected of the clients, whether they used HWT or not, and the mastery criteria set to progress through handwriting programs. Some BCBAs required clients to practice letter formation on HWT worksheets, whereas other required them to practice on single or three-line paper. There was also not a single, standardized way to measure correct formation or legibility with the clients' handwriting samples during ABA programming trials. The mastery criteria varied between clients and was subjective in nature as it was part of the behavior technician's role to decide if the handwriting was appropriate and legible even though no formal training had taken place on how to properly complete this task.

The needs assessment also involved creating a pre- and post-implementation survey to assess the staff's knowledge and confidence regarding handwriting programs. The survey required the staff to score a pre-kindergarten and kindergarten handwriting sample. The scoring was based on the scoring criteria from the HWT Print Tool, including: start, sequence, orientation, placement, control, and size (Olsen & Knapton, 2008). The criteria listed focuses on the formation, neatness, and proportion of the letters (Olsen & Knapton, 2008). The survey also included a section for the staff to rate their confidence with scoring the handwriting examples and their ability to carry out clients' handwriting programs.

After conducting the needs assessment at the site, multiple problem areas related to the occupational performance and participation of handwriting were identified. Overall, the staff members felt they did not have the proper training and knowledge to carry out handwriting programs. The average confidence rating from the pre-implementation survey was a 2.8 on a five-point Likert scale. The staff noted they were not sure how to score the handwriting examples. Out of 43 staff members that completed the pre-implementation survey, 21% scored all parts of the pre-kindergarten example correctly and 37% scored the kindergarten sample

correctly. Some specific questions/concerns noted by staff included: defining the scoring criteria, age-appropriate pencil grasps, the developmental progression of handwriting, how often to practice handwriting with clients, and when to progress a client onto the next letter when using the HWT program (ABA Center Staff, personal communication, 2018). When observing the technicians complete various handwriting programs, it was evident that there was not a standardized way to carryout handwriting programs with clients. The technicians often noted that they were not sure if they were carrying out the programs properly and that they just "gave it their best shot" (ABA Center Staff, personal communication, 2018). The occupational therapist and BCBAs both stated that they had concerns about this and felt that it was vital to create a standard way to teach, score, and collect data on each client's handwriting (A. Seal & Site BCBAs, personal communication, 2018).

The results of the needs assessment showed that the site would benefit from an occupational therapy perspective on how to implement a handwriting program. The BCBAs explained during their interviews that they do not receive specific training on how to teach a child handwriting (Site BCBAs, personal communication, 2018). Instead, they receive training on how to teach children various skills, which can include handwriting, using the concepts of reinforcement and discrete trial training (Autism Speaks, 2012; Site BCBAs, personal communication, 2018). On the other hand, occupational therapists are trained to evaluate the performance skills and patterns related to a client's occupations, in this case the client's handwriting (AOTA, 2014). After identifying the underlying deficits and problems, occupational therapists create and implement an intervention plan to reach targeted outcomes (AOTA, 2014). Regarding handwriting, occupational therapists can evaluate and treat the underlying components such as motor planning, motor control, muscle tone, endurance, and

coordination (AOTA, 2014; AOTA, n.d.). Occupational therapists can also help promote a proper grasp, letter formation, and body mechanics related to handwriting (AOTA, n.d.). Therefore, while completing my doctoral capstone at the participating ABA center I acted as an occupational therapy consultant with the ABA professionals as I created and implemented my handwriting program.

Outpatient and School-Based OT

When comparing outpatient OT, which is carried out at ABA centers, with other OT areas of practice such as school-based OT, there are clear similarities and differences (Six, 2016; Wisconsin Council on Developmental Disabilities [WCDD], 1999). Outpatient OT is governed by state and federal practice guidelines and focuses on reaching functional goals in both the home and community (Six, 2016; WCDD, 1999). This practice area uses the medical model to guide practice, which involves a diagnosis and referral from the physician (Six, 2016). The amount, frequency, and duration of OT services in outpatient OT is determined by the collaboration of the physician, family, and therapist as well as the approval from insurance (WCDD, 1999). At my site, the occupational therapist typically treats clients for 30 minutes to an hour either once a week, twice a week, or every other week (A. Seal, personal communication, 2018). Intervention is typically one-on-one and can address a variety of goals including but not limited to activities of daily living, play, social participation, and education (Six, 2016; WCDD, 1999).

Unlike outpatient OT, school-based OT is governed by state and federal laws such as the Individuals with Disabilities Education Act (IDEA) (WCDD, 1999). The decision regarding the frequency and duration of services in school-based OT includes the input from the Individualized Education Plan (IEP) team, which can include the family, therapists, regular education teachers,

special education teachers, a representative of a public agency, the child if appropriate, and other individuals with knowledge and expertise regarding the child (Center for Parent Resources and Information, 2017; WCDD, 1999). Intervention can be provided in a group or one-on-one, typically 30 minutes once per week, and is based on the education model, meaning all goals must relate to the educational needs of the child (Six, 2016; WCDD, 1999). Examples of skills addressed by a school-based therapist include improving educational skills such as writing, cutting, and completing homework as well as increasing participation in school routines, and a child's social participation (AOTA, 2016). Therapy takes place where the child receives education including the "classroom, hallways, gyms, playgrounds, lunchrooms, bathrooms, or in a separate therapy room" (WCDD, 1999). This is different than OT at an ABA center, where intervention is only provided one-on-one and can address not only educational goals, but other goals such as activities of daily living, sensory processing, and play (A. Seal, personal communication, 2018).

A major similarity between outpatient OT carried out at an ABA center and school-based OT is the role an occupational therapist can play as a consultant (Six, 2016). Since the clients at an ABA center typically are on site 40 hours per week for ABA therapy, the occupational therapist can act as a consultant for clients that are not on his/her caseload as well as making sure recommendations are being carried out with the clients on his/her caseload. The occupational therapist at my site will teach the BCBAs and behavior technicians how she wants them to practice the interventions she completes during her sessions. She may also have conversations with behavior technicians when concerns arise about areas that fall within the OT scope of practice (A. Seal, personal communication, 2018). School-based occupational therapists also act as consultants, where they can work with teachers and other staff (AOTA, 2016; Six, 2016).

Some examples include ways to help reduce the number of barriers present in the school environment, ways to modify classrooms and buildings to make them accessible for all as well as providing input on school initiatives such as bullying (AOTA, 2016). Working as an OT consultant during my doctoral project will be very beneficial not only for the site, but it will also help me gain important skills that I can use in other practice areas in the future.

Implementation

The implementation phase of my doctoral capstone consisted of designing a handwriting program, educating ABA staff on the program materials, and training them to effectively implement it. The first step in designing the handwriting program involved deciding which HWT programs would be included. Based on the needs assessment, it was clear that the pre-k and kindergarten HWT programs were the most appropriate for my site. Therefore, the data sheets and measuring tool were geared towards these grade levels. The data sheets consisted of two sections, one to record the morning probing results and one to record afternoon teaching. The areas tested for the pre-k program included tracing, start, and sequence. The kindergarten program tested orientation, start, sequence, placement, and control. These categories were based on the scoring criteria in the HWT Print Tool, an assessment tool used to evaluate the formation of letters and numbers (Olsen & Knapton, 2008). After determining what to include on the data sheets, I set the mastery criteria for each program. In ABA, mastery criteria are "the number of independent correct responses over a number of days needed for a target to be considered mastered (learned)" (ABA Teaching Ideas, n.d.). These criteria varied between the handwriting programs I created. Clients were required to score a 70% or higher on all the categories for two days in a row for each letter to be considered mastered. Along with the creation of the data sheets, I made a measuring tool, also based on the Print Tool, to help the behavior technicians

score clients' handwriting (Olsen & Knapton, 2008). The measuring tool was printed on a transparency film which is laid over top of the clients' worksheets to help score tracing, start, placement, and control. The measuring tool helped increase the objectivity of scoring as well as the inter-rater reliability between the behavior technicians.

After creating the data sheets and measuring tool, I collaborated with my site mentor and the site's BCBAs to decide which clients would be appropriate to include in my handwriting program. It was decided that ten clients, four for pre-k and six for kindergarten, would be included in the program. These clients were chosen based on their age, ABA goals, and ability to comprehend and complete the handwriting expectations. The handwriting programs were designed to follow the developmental progression of letters set by HWT. However, since many of the kindergarten-level clients had previously participated in HWT, I created a baseline test to assess their formation of capital letters and determine their starting point in the HWT progression. This meant that for the kindergarten program each client could start at various letters within the HWT progression based on their performance on the baseline test. I had all the pre-k clients start at the beginning of the pre-k program progression. The data sheets were then customized to fit each client's individual program needs. The customizing included which days the data was probed, what program the client was working on, the number of letters the client was practicing, and the mastery criteria to progress through the program, if the 70% requirement was too hard for the client to meet.

Once the handwriting programs were finalized, I began to implement them with the clients over a two-week period. The implementation consisted of probing (testing) clients' handwriting skills in the morning and teaching in the afternoon. While implementing the programs, I consulted with and taught the behavior technicians how to carry out the programs,

score the handwriting, and record the data. To probe the clients' handwriting, I had them complete three separate HWT letter worksheets. Clients received reinforcement of their choice after completing their worksheets. While the clients were in reinforcement, I explained how I was scoring the handwriting and recording the data to the behavior technicians. For the afternoon teaching sessions, I clarified with the technicians that I wanted them to focus on the areas that were difficult for the client. For example, if the client scored high on start and sequence, but low on placement, I would have them focus on teaching placement. During this two-week period, I realized that three of the clients were proficient with the kindergarten program and it would be more appropriate for them to move to a three-lined paper program. This program focused on how to correctly place letters on three-lined paper. This led to the creation of a data sheet for the three-lined paper program, various forms of three-lined paper, and additional scoring tools on the measuring tool to score start, placement and control on three-lined paper.

In addition to the individual collaboration with the behavior technicians, I provided an in-service training for all the staff at the site. The presentation included information on the data sheets and measuring tool as well as videos of me scoring both a pre-k and kindergarten example using the materials. During the second half of my rotation, I had the staff continue to implement the clients' handwriting programs and integrate them into their overall ABA programming. I was present during the sessions the first few weeks to ensure the behavior technicians were carrying out the programs properly and scoring the clients' handwriting correctly. This gave the technicians a chance to ask questions as they arose. At the end of my rotation I had the staff complete a post-implementation survey. The post-implementation survey was identical to the pre-implementation survey and tested if the knowledge and confidence of the staff improved

through my program implementation and education. During my last week, I held a final in-service with the site staff to discuss the survey results, inform them of any final changes made to the data sheets or measuring tool, and encourage them to continue to use the program with clients in the future.

The one-on-one collaboration with staff, in-services, and surveys were all used to help promote staff development. As mentioned previously, the pre-implementation survey showed that staff could improve both their knowledge and confidence with scoring handwriting and carrying out handwriting programs in general. Therefore, the benefits of handwriting and how to implement the handwriting program were constantly emphasized with the ABA center staff in hopes of increasing their comprehension as well as the use and carryover of the program upon completion of my capstone experience. This technique was successful as the post-implementation survey showed an overall increase in both the ability of staff to score handwriting and their confidence with scoring and programming. This is important because the staff are required to construct and carry out clients' programs. It is vital that the staff have the confidence and knowledge base to make them successful. This project allowed the staff to increase their understanding of how to implement a handwriting program into their clients' ABA programs.

Leadership Skills

To facilitate interdisciplinary collaboration between OT and ABA throughout my program development and implementation, I used various leadership skills including open communication, adaptability, positivity, and responsibility. Open communication allowed my site mentor, the ABA staff, and I to all be on the same page and working to the same goal of implementing a standardized handwriting program. After completing the CliftonStrengths®

assessment, I discovered that one of my top five strengths is adaptability, which helped me throughout this project as plans were constantly revised (Gallup, 2012). When changes to my plan, or demanding situations arose, I used my adaptability skills to calmly handle the pressure and adjust my priorities and processes as needed. Another top strength of mine is positivity which is commonly used by people to get others excited about what they plan to do (Gallup, 2012). I used positivity at my site to help get staff on board about the idea of having a new handwriting program. I used enthusiasm when I met with each team at the beginning of my capstone and explained what I envisioned for my project to help get them interested in my idea. Finally, I had to take the responsibility of creating my program into my own hands. I had to stay on top of my program plan and independently manage my time to reach my desired goals. This was a difficult transition because I was used to basing my time on fieldwork educators' schedules or goals for each day.

Service Provision

Using these leadership skills helped me advocate for myself as an occupational therapy consultant. The specific consultation models I used to guide me during this project were colleague and system consultation (Dunn, 1988). I used these models to help increase the skills and knowledge of the ABA professionals at my site, which in turn improved the overall effectiveness of the services provided to their clients. During my consultation, I used active listening skills to help address the needs and concerns staff brought to my attention. As the program leader, I felt it was my responsibility to continually adapt myself and my techniques to best address the needs of the individual staff members and the site overall. Through consulting, I increased the staff's understanding of handwriting, why it is important, what OT's role is with handwriting, and how to implement the specific handwriting program I designed. Overall the

strength of the services provided to clients at the site increased by adding a standard handwriting program.

Discontinuation and Outcomes

Outcome measures were used to assess the effectiveness of the handwriting program and interdisciplinary collaboration with ABA staff members. To evaluate the success of the program and collaboration, the post-implementation survey results were compared to those from the pre-implementation survey. The post-survey results showed an increase in the staff's ability to score clients' handwriting as well as an increase in their confidence level with implementing clients' handwriting programs. The percentage of staff that scored all parts of the pre-kindergarten example correctly more than doubled, with 50% scoring it properly on the post-implementation survey. The percentage of staff that scored the kindergarten sample accurately also increased from 37% to 45%. Staff's average confidence level also increased from 2.8 to 3.8 on a five-point Likert scale. Sharing the survey results with the staff during the last week of my capstone provided them with proof of the knowledge they have gained regarding handwriting and how their confidence with implementing handwriting programs has improved. By reviewing the survey results, the staff will hopefully be more inclined to continue the program upon completion of my capstone.

Sustainability is a key component to consider as part of the discontinuation phase. Scaffa and Reitz (2014) state that program sustainability is an ongoing process and to be sustainable a program must be adaptable and supportable. To support the program and staff, I created a folder on my site's shared drive with the handwriting resources I used and created during my capstone. During the in-service and one-on-one consultation with the behavior technicians I explained how to access and use the resources appropriately. As the implementation transitioned to the

behavior technicians, I made changes and adapted the handwriting resources and individual programs as concerns were brought to my attention. For example, if the handwriting program criteria was too difficult for a client to meet, the program was adapted to meet his/her individual needs. The staff's feedback also led to changes on the data sheets and the measuring tool to make them easier to use and understand. I am confident that these changes will increase the sustainability and carryover of the handwriting program for years to come. My site mentor anticipates that this program will be expanded to the company's other locations and used to train new staff to increase consistency with handwriting programs (A. Seal, personal communication, 2018).

Following discussion with my site mentor and the BCBAs about sustaining my project, we decided that it will be the responsibility of the BCBAs and behavior technicians to continue implementing the handwriting programs (A. Seal, Site BCBAs, personal communication, 2018). It will be essential for the behavior technicians to incorporate the data sheets and measuring tool when teaching, scoring, and recording data on handwriting. The BCBAs will also collaborate with my site mentor, who is an occupational therapist, to decide when other clients are appropriate to start working on handwriting. The BCBAs will contact my site mentor when they feel a client has appropriate attention and pre-writing skills to start handwriting. Then, my site mentor will complete an informal consult, if the client is not on her caseload, to assess the client's pre-writing strokes, fine motor skills, motor planning skills, etc. My site mentor will also take over my role and answer any questions or concerns that arise regarding clients' handwriting (A. Seal, Site BCBAs, personal communication, 2018).

Quality Improvement

It is important to consider quality improvement throughout the discontinuation process. Quality improvement can be used to incorporate scholarly evidence with a clinical problem or issue and in turn improve the quality of care (Bonnel & Smith, 2018). After determining the needs of my site, I used evidence-based practice to guide the creation and implementation of the handwriting program. I also used evidence-based collaboration techniques to promote interdisciplinary practice. Batalden and Davidoff (2007) state that quality improvement can be used in healthcare to improve patient outcomes, system performance, and professional development. The intent of my capstone was to use interdisciplinary collaboration to create and implement a handwriting program that would improve the quality of the services provided to the clients at the participating ABA center. The handwriting program and techniques that were taught to the behavior technicians during consultation helped decrease any inconsistencies between the quality of services provided to clients at this site by creating a standardized way to teach and score handwriting. By collaborating with the ABA staff to create and implement the handwriting program, the clients' outcomes and site's overall performance will hopefully improve overtime.

The handwriting program and my consultative role helped improve the professional development of the staff at my site. The clinical director at my site required all staff members to attend the in-service to ensure consistency with the handwriting programming going forward. Batalden and Davidoff (2007) explain that quality improvement will not occur until it becomes an intrinsic part of everyone's day and mindset. By having the staff implement the program while I was on-site, I made sure they were independently incorporating the handwriting program into their daily routines and ABA programs as well as understanding how to score and record the

handwriting data. I had the behavior technicians save the handwriting worksheets after the clients completed them and when time allowed, I went through and scored the worksheets myself to crosscheck if the staff had scored and recorded the handwriting data correctly. The intent of the crosschecking was to increase inter-rater reliability with scoring and ensure that the staff will adequately carry out the program after my capstone.

Addressing Society's Needs

The long-term goals of my project aim to address the changing needs of society. This project facilitated both the clients and staff at my site to be more productive members of society. Regarding the clients, the handwriting program will not only improve their academic skills, but can also increase their communication and motor skills. Communication skills are vital to one's everyday functioning in society. By teaching handwriting, a child can communicate their wants and needs, provide safety information if needed, and form relationships with others. A research review conducted by HWT discussed a survey of kindergarten to fifth grade teachers which found that students spend 24 to 58% of their classroom time writing on paper (Olsen & Knapton, 2015). With educational standards and overall demands on students increasing, we, as a society, need to create ways to enable children to succeed. The handwriting program specifically increases the handwriting skills of the clients at my site. The program can help prepare individuals with autism to stay on track with their typically-developing peers if they transition out of the ABA site to mainstream schooling. Regarding staff, this project has taught them the benefits of handwriting and how to effectively collaborate with another discipline, in this case occupational therapy. The collaboration skills can be used with other staff members and disciplines at the site, outside consults, and people the staff encounter in society. In addition, by

having the staff learn about occupational therapy they can be advocates for the profession, its benefits for children with special needs, and increase appropriate referrals to OT.

Overall Learning and Communication

Throughout my doctoral capstone experience, I learned and practiced valuable skills which I will be able to use in my future practice. These skills included working independently, being adaptable and flexible, collaborating with other disciplines, and using critical thinking skills. I worked independently to create and design the handwriting program and checked in with my site mentor periodically via email, or in person, to update her on my progress as well as ask questions about the program. Working independently will be vital to my future practice since I will not have a fieldwork educator or site mentor constantly monitoring my every move. To reach my intended goals and objectives it was important to be adaptable, flexible, and collaborate with staff due to frequent schedule and/or program changes. Examples of changes included: shifting the probe dates from a frequency of three times a week to two times a week, altering my schedule to work well with the staff's schedule, and modifying how I explained various OT topics to staff to increase their comprehension. As an occupational therapist, it will be important to be adaptable as I collaborate with peers, clients, and families daily. Lastly, I think my critical thinking skills improved during my capstone. I used critical thinking to develop and change the handwriting program as needed to best fit the needs of the site and the clients. In my future practice, critical thinking skills will be key when completing evaluations and designing interventions for clients.

Through consultation with staff, I practiced teamwork and continued to improve professional characteristics such as being organized, timely, and accountable. Teamwork was vital to my capstone as it allowed for interdisciplinary collaboration and for me to successfully

implement the handwriting program. Acting as an OT consultant, I continuously collaborated with ABA staff members to design and implement the handwriting program. The staff and I bounced ideas off each other to help determine the best design of the data sheets, what aspects of the measuring tool were easiest to use and understand, and various OT techniques to get the clients to be more successful with handwriting. When consulting with the staff, I advocated for the profession of OT and used my OT mindset to increase collaboration and improve services for the clients at my site. I also acted as a leader throughout my doctoral capstone experience. The behavioral technicians relied on me for guidance and direction when implementing the handwriting program. At times, the staff became too reliant on me and my feedback which required me to take a step back and let them implement the clients' handwriting programs independently which further developed my skills in delegating. This assisted staff in gaining confidence as well as a better understanding on how to score and record the handwriting data. By removing myself from the day-to-day implementation from the program, the staff realized they have the knowledge and skills to continue the handwriting program following my capstone. When I start my career as an occupational therapist, continuing to collaborate with other disciplines and using teamwork, leadership, and advocacy will be key to my success.

Communication skills were vital to help me successfully design and implement the handwriting program. I was expected to have good written, verbal, and non-verbal communication skills. Written skills were used when writing emails and creating resources for the handwriting binder. I used email to keep my site and faculty mentors up to date as well as send out information regarding my program and in-service to ABA and senior staff at my site. I used professional language when composing emails and creating my resources to ensure my verbiage was clear for other disciplines at my site to understand. In addition, I ensured people of

all educational backgrounds could understand the information in my emails and resources by using simple language and providing examples. Verbal communication skills were used daily when talking with my site mentor, the BCBAs, behavior technicians, and clients. I was in constant contact with other individuals on site, requiring me to use professional and appropriate language every day. During my in-service, I used language that was easy for staff to comprehend and follow to increase the carryover of the program. Non-verbal communication skills were very important during my interaction and collaboration with staff. This included having a professional appearance, making appropriate eye contact, having good posture, and conveying my facial expressions appropriately. Non-verbal skills can often be overlooked, but it was essential for me to continually assess all my communication skills when interacting with staff. If overlooked, poor communication skills can have detrimental effects on collaboration and client care. The communication skills I gained and practiced during my capstone experience will be carried over into my future practice and continue to develop as I work with peers and future clients.

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