A Study on Perceptions to Provide Literacy Instruction to Students with Multiple Disabilities

by

Rachelle Rectenwald

Bachelor of Arts, University of Pittsburgh, 1993

Master of Education, University of Pittsburgh, 1997

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This dissertation was presented

by

Rachelle Rectenwald

It was defended on

July 7, 2021

and approved by

Frances Mary D'Andrea, Ph.D., Assistant Professor of Practice, Department of Teaching, Learning, and Leading

Charlene A. Trovato, Ph.D., Associate Professor, Department of Teaching and Learning

Dissertation Director: Mary Margaret Kerr, Ed.D., Professor, Department of Health and Human Development

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Rachelle Rectenwald, Ed.D.

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Despite the push for increased opportunities for all children, literacy research for students with visual impairment and multiple disabilities is lacking. The aim of this study was to increase perceptions and confidence of staff in providing literacy instruction to this population of students. The study design incorporated quantitative measures, although opportunities existed for qualitative measures as well. The participants included twelve staff from a specialized school in the Mid-Atlantic region of the United States. Over the course of two months, staff participated in three, 45-minute professional development sessions. The three sessions included a review of current research on literacy, literacy for students who are nonverbal, and braille literacy. All participants completed a pre-survey and post-survey to determine any change in either perception or confidence in providing literacy instruction. The analysis showed a significantly higher agreement at post-survey compared to pre-survey for both perception and confidence, which were both statistically significant. At post-survey, all of the respondents felt that literacy instruction is appropriate for every student. Despite the small sample, the findings are encouraging for both practitioners and administrators.

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Preface

"Believe in yourself. You are braver than you think, more talented than you know, and capable of more than you imagine." —Roy T. Bennett

They say that every journey begins with a single step. In my case, there have been many steps, and I am sure some missteps. There were certainly times where I doubted my ability, and I know it truly took the support of numerous strong women for me to finally achieve my dream of receiving my doctorate. Thank you for keeping me on the path.

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1.0 Introduction

Literacy has a positive impact on every individual. The aim of this study was to increase the perception and confidence in providing literacy instruction to students with multiple disabilities and visual impairment (VI). Research indicates that students of *all* abilities learn if they receive increased instruction, appropriate strategies, and focused attention to literacy development. Literacy is an important component of daily living and lifelong learning. Due to the Every Student Succeeds Act's (ESSA) push for increased opportunities for all children, the current research base needs to be broadened so these students do not fall between the cracks (U.S. Department of Education, 2015).

Historically, attitudes and confidence of educators may influence the literacy of this population of students. ESSA emphasizes an increase in literacy for all students as a priority. However, many Teachers of the Visually Impaired (TVIs) are not providing literacy instruction for students with multiple disabilities. Although it has been established that reading instruction should be a priority for all, teacher perception regarding ability prevents learning. In particular, students with VI and multiple disabilities are often excluded from formal reading instruction (Durando, 2008). Some TVIs do not feel adequately prepared to instruct these students in acquiring reading skills (Durando, 2008; Zebehazy, 2014). Other TVIs believe their time is best spent on functional daily living skills which are important components of the Expanded Core Curriculum (ECC). TVIs often spend the majority of their time instructing on the ECC and there is little time left for literacy instruction. However, literacy is included in the compensatory skills section of the ECC. It is often overlooked by educators. These students have numerous needs and often literacy

is not given a priority. Teacher attitudes and perceptions heavily influence others and may prevent or inhibit learning.

These inaccurate perceptions of student ability support the need for literacy instruction for these students who are often excluded from formal reading instruction (Durando, 2008; Ferrell, 2006) further placing them at a disadvantage. According to Barraga (1986), children with VI are two years behind sighted children in concept development. For students with VI and multiple disabilities, the gap may be even larger. Hence, it is imperative that attempts at literacy acquisition continue throughout students' educational experience. The research on literacy instruction for this low incidence population is scarce and costly, but it is essential. These students must be included in funding, statistics, and have access to specialized services.

The positive effects of literacy extend beyond the classroom for those with significant disabilities. Many of these students are nonverbal and require Alternative and Augmentative Communication devices (AAC) in order to learn to communicate. "When a student learns to communicate -- regardless of the modality used to do so -- he or she then will be better able to participate in play and other school activities and is more likely to be perceived in a positive light by peers, teachers, and parents" (Holbrook et al., 2017, p. 377).

2.0 Literature Review

Since the introduction of No Child Left Behind (NCLB) in 2001, students with multiple disabilities should be afforded the same opportunities for literacy instruction as their typically developing peers. The intent of NCLB is to "close the achievement gap with accountability, flexibility, and choice, so that no child is left behind" (U.S. Department of Education, 2001). In addition, the Individuals with Disabilities Education Act (2004) further supports the need for literacy instruction for all students. In 2015, NCLB was renamed Every Student Succeeds Act (ESSA). NCLB put in place measures that exposed achievement gaps among traditionally underserved students and their peers including increased accountability for *all* children further supported by ESSA. It recognizes the importance of improving the quality of instruction and increased outcomes for all students (U.S. Department of Education, 2015).

Even though NCLB emphasizes an increase in literacy for all students as a priority, teachers still doubt that their students with multiple disabilities can learn to read (Durando, 2008). In addition, some teachers often do not feel adequately prepared to instruct students with multiple disabilities in acquiring reading skills (Durando, 2008). Other teachers believe their time is best spent on functional life skills which are important components of the Expanded Core Curriculum (ECC). The ECC is defined as the body of knowledge and skills needed by students with visual impairments due to their unique disability (American Foundation of the Blind, 2014) and is a requirement for all students with VI. Students with multiple disabilities have numerous needs and often literacy instruction is not given a priority. The term literacy has a variety of definitions, but for the purpose of this review, it is defined as the ability to use written words (Durando, 2008). This includes Alternative and Augmentative Communication (AAC), object symbols, daily

schedules, and all skills that lead to reading such as phonics, alphabet instruction, decoding, and comprehension.

These findings support the need for the U.S. government's push to decrease the number of students needing services related to the Individuals with Disabilities Education Act (IDEA) due to lack of proper reading instruction. IDEA defines students with multiple disabilities as:

concomitant impairments (such as mental retardation-blindness or mental retardation-orthopedic impairment), the combination of which causes such severe educational needs that they cannot be accommodated in special educational programs solely for one of the impairments. Multiple disabilities does not include deaf-blindness. (IDEA, 300.8 (c)(7))

While there is a wealth of research surrounding reading instruction, especially for elementary aged students (U.S. Department of Education, National Reading Program, 2009), relatively little is known about reading instruction for students with Visual Impairment (VI) or students with multiple disabilities. According to the data obtained from the federal quota registration conducted annually by the American Printing House for the Blind (APH), more than 32% of all school-aged students are considered non-readers (APH, 2016). These results are inclusive of students with multiple disabilities. Although APH warns about using the census data to make determinations on literacy levels, it is predicted that over 80% of students with multiple disabilities are considered non-readers. These findings support the need for literacy instruction, especially for students with multiple disabilities (Browder et al., 2009).

The Pennsylvania Department of Education continues to be invested in the learning of all students. In a response to literacy needs throughout our commonwealth, The PA State Plan for Literacy was developed. The plan, guided by Pedro A. Rivera, Secretary of Education, was developed in an effort to promote literacy growth through high school graduation (Commonwealth

of Pennsylvania, 2021). There are three main goals of this project: (a) to improve literacy learning outcomes and increase reading achievement for all students; (b) to create a culture of data-informed decision making in which multiple measures of assessment are used at the state, regional, and local levels to inform instruction and for accountability purposes; and (c) to create 21st century classrooms and schools in which digital technology, including Universal Design for Learning (UDL), is an integral aspect of instruction and in which teachers are provided with the professional learning they need to assist students in using multiple pathways to express and represent information (Commonwealth of Pennsylvania, 2021). These combined efforts on providing literacy instruction include professional development of staff, parents, and community members. The Professional Development (PD) piece resonates with me, as research for students with multiple disabilities shows that even though literacy should be taught to all, there are many that are missing this important part of instruction.

The benefits of literacy, including positive post-school outcomes, are desirable qualities for all students. Still, students with multiple disabilities are often excluded from formal reading instruction (Durando, 2008). Children without adequate word recognition skills read less, read slowly, develop vocabulary at a slower rate, and are less motivated to read. Children who are successful read more, have better vocabulary, have improved comprehension, and are more motivated to engage in reading (Stanovich, 1986).

Based on the lack of previous research and the increased attention towards academic instruction for all students, it is relevant to explore the current research base regarding literacy instruction for students with multiple disabilities. Students with Severe Cognitive Disabilities (SCDs) continue to be disadvantaged when it comes to literacy instruction. They continue to be supported by a TVI and their educational team, but that support is variable. Teachers' beliefs

regarding the importance of literacy instruction for students with SCDs may factor into their instructional decisions (Zebehazy, 2014). For these reasons, I focused on literacy instruction for students with multiple disabilities, including visual impairment. Specific factors addressed include: (a) the participants and settings where the interventions were conducted, (b) the designs and purpose of the studies, (c) procedures, and finally, (d) the outcomes and benefits for students.

2.1 Search Procedures

Three computerized databases (PsychINFO, WEbofScience and ERIC) provided the foundation for the initial search. Descriptors and all possible truncations included *literacy, reading, visual impairment, blindness,* and *multiple disabilities* with open-ended dates to include the breadth of the available research. An ancestral search was conducted on identified articles. A hand search of the *Journal of Visual Impairment and Blindness* dating back to 1994 completed the search for articles that met the inclusion criteria. This search produced one additional result. Neither the original nor hand-search produced articles that dated prior to 1997, which included students with multiple disabilities. In retrospect, more articles might be found if AAC or CVI were included in the initial search criteria.

2.2 Inclusion Criteria

In order to meet criteria, all articles had to:

1. Appear in a peer-reviewed journal, written or translated into the English language.

2. Include participants ages three through 21 at the time of the study.
3. Include studies with both multiple disabilities and visual impairments, including blindness as reported by the author of the study.
4. Exclude studies that did not have a dependent measure of a literacy outcome (McKenzie & Davidson, 2007).
5. The independent variable being measured includes a literacy or communication intervention.

The initial on-line database search produced 303 articles of which five met inclusion criteria (McCall & McLinden, 2001; Ek et al., 2003; Klenk & Pufpaff, 2011; Browder et al., 2011; Mims et al., 2009). PsyArticles revealed 75 documents, none of which met inclusion criteria and were discarded. The ancestral search revealed an article (Erickson et al., 1997) and one additional article resulted from the hand search (Stauffer, 2008). The qualifying seven articles (McCall & McLinden, 2001; Ek et al., 2003; Klenk & Pufpaff, 2011; Browder et al., 2011; Mims et al., 2009; Stauffer, 2008; Erickson et al., 1997) were reviewed and organized between interventions related to student outcomes for students with multiple disabilities, including visual impairments. The results from the ABC Braille Literacy Study (Emerson et al., 2009) are noteworthy as it relates to the importance of early literacy for children with visual impairments. This study did not meet the inclusion criteria because it addressed the single disability of VI. However, it piqued my curiosity regarding teacher perception as each teacher determined whether to teach contracted or alphabetic braille. These perceptions will be paramount in professional development and pre-service programs for TVIs. Diane Wormsley's I-M ABLE Approach to Braille Literacy favors contracted braille over uncontracted braille for students that are VI and have cognitive disabilities (Wormsley, 2011). Furthermore, success stories were shared using Wormsley's approach that support the

importance of braille instruction for students with significant cognitive disabilities (Campbell, 2011; D'Aurizio, 2011; Erin, 2011).

2.3 Results

The results are divided into four subheadings: setting and participants, research designs, research procedures, and summary of outcomes. The seven studies meeting inclusion criteria have publication dates ranging from 1997 to 2011 with only one occurring prior to NCLB in 2001 in the U.S. This has significant implications for the timeliness of the research and the limited availability of relevant data to support best practices in the field. Four of the studies were conducted in the United States and three were conducted internationally. All four of the studies in the U.S and the sole study found in the U.K. were conducted with tactile object cues, the Moon Code or braille. The two remaining studies used print as the student's primary learning medium.

2.3.1 Setting and participants

A total of 13 participants with multiple disabilities, including visual impairments (VI) met criteria in the identified articles. Three studies were conducted in a school for the blind (Ek et al., 2003; McCall & McLinden, 2001; Stauffer, 2008), two were in self contained classroom settings (Browder et al., 2011; Klenk & Pufpaff, 2011) and two in regular education settings (Erickson et al., 1997; Mims et al., 2009). The students' ages varied from pre-school (Ek et al., 2003) through secondary (Stauffer, 2008) and were represented throughout all age groups with the majority aged

9-11 (Browder et al., 2011; Erickson et al., 1997; Klenk & Pufpaff, 2011; Mims et al., 2009). A description of their diagnoses is included in Table 1.

Table 1. Summary of Studies Reviewed

Author(s)	Setting & Participants	Diagnoses	Design	Purpose	Dependent Measures	Results
McCall & McLinden (2001)	4 children, School for the Blind	Congenitally blind, complex cognitive and physical difficulties, multiple disabilities	Tactile/braille-like, qualitative	U.K. Moon approach; focus on academic progress, but found other benefits	IV – instruction in Moon Code using stories DV – acquisition of symbols in the Moon Code	Braille is easier and cheaper to reproduce, even though Moon was invented first; IMO, Moon is too abstract and braille should be used
Klenk & Pufpaff (2011)	10-year-old male, self-contained classroom	Retinopathy of prematurity, Autism	Case study, braille, single subject, qualitative	Assess use of Tack-Tiles: Three years of previous braille instruction showed little progress. Tack-Tiles used plus I-M Able approach (Durando & Wormsley, 2009)	IV – Tack-Tile instruction DV – alphabet letters gained	Less physical prompting and an increase from 17%-83% in letter recognition
Mims et al. (2009)	2 students, public school	Age 6 – CVI, cerebral palsy, bronchopulmonary dysplasia, developmental delay Age 9 – Severe VI, cerebral palsy, microcephaly, seizures, developmental delay	Tactile, multi-probe design across materials with concurrent replications, qualitative	Increasing comprehension using shared stories	IV – shared stories with object cues DV – comprehension # of correct responses (of 2 choices)	Used least-to-most prompt system or System of Least Prompts (SLP)

Table 1 (continued)

Browder et al. (2011)	9-year-old female, self-contained classroom	Legally blind, severe intellectual disability	Multi-probe single case design, qualitative	Using shared stories (choice of two) with object cues	IV – task analysis for using shared stories DV – comprehension and engagement	Baseline comprehension (.14) during intervention (4.3); baseline engagement (6.5) during intervention (22.1)
Stauffer (2008)	1 male student, School for the Blind	Microphthalmia, hypoplastic optic nerve, concurrent diffuse, developmental delays	Braille, incidental learning, case study, qualitative	Keyboarding instruction	IV – keyboarding curriculum DV – Braille letters learned through incidental learning	Good empirical data; performance improvement (pp. 76-77)
Ek et al. (2003)	4 children, School for the Blind	All 4 students – cerebral visual impairment, multiple disabilities; one student had cerebral palsy	Qualitative and quantitative	CVI – IQ testing not reliable for children with VI and way off base with CVI rationale	IQ, self-esteem, visual acuity	Poor vision, but improved, not able to test IQ for student with multiple disabilities, "too low cognitively"
Erickson et al. (1997)	11-year-old male, 4th and 5th grade regular education	Mild to moderate VI, speech impairment, physical impairment, cerebral palsy	Qualitative longitudinal case study	Communication and literacy, print/pictures	BRI, PPVT-R, progressed from 6-40 squares on his Dynavox	Did not pre-test, but described AAC eval prior to instruction

2.3.2 Research designs

As reported in Table 1, four studies were case studies and three were single subject research designs. Although all seven studies used qualitative data (Browder et al., 2011; Ek et al., 2003; Erickson et al., 1997; Klenk & Pufpaff, 2011; McCall & McLinden, 2001; Mims et al., 2009; Stauffer, 2008;), three studies also used quantitative data to support their intervention (Browder et al., 2011; Mims et al., 2009; Stauffer, 2008). In the three studies that used both qualitative and quantitative data, baseline data were maintained, interventions were clearly stated, and experimental effect was demonstrated during at least three different points in time (Horner et al., 2005). In addition to these common traits, all three studies were easily replicable, produced significant results, and were rigorous in their data collection procedures. Stauffer (2008) included the entire keyboarding curriculum she developed in order to facilitate the incidental learning of braille. Initially, keyboarding was taught on an electric typewriter for proprioceptive feedback, but eventually transferred to a computer keyboard for a more appropriate medium and generalization of skills. Braille overlays were used on both pieces of equipment in order to provide exposure to braille while using a whole language approach to literacy in an effort to teach both reading and writing skills. The purpose of the study was to determine if the student would recognize braille letters while learning to type. Stauffer's (2008) study was unique in that it taught keyboarding exclusively using an electric typewriter for increased feedback for her student. The author never instructed her student in braille, but simply exposed the student to braille by using a braille overlay on the keyboard and instructed using a whole language approach to literacy (Goodman, 1992). The student demonstrated an ability to learn braille through incidental learning, which developed simultaneously while embedding essential concept skills during keyboarding lessons. This study

is the only one (of the alphabetic studies) that met criteria for quality indicators within single-subject research according to Horner et al. (2005).

Mims et al. (2009) provided all participants with real objects to increase their understanding by using concrete objects including repeated opportunities to use those objects in a meaningful way (i.e., systematic prompting). Furthermore, the authors assumed an understanding and did not wait for the participants to acquire prerequisite communication skills. Mims et al. (2009) provided all of the adaptations and objects used with each of the three books by title and author. Each book was chosen according to a repetitive line or phrase that was reinforced through the use of shared stories. Specific examples of the 10 comprehension questions were included for each story. The study evaluated a least-to-most prompting system to increase the number of correct comprehension responses during a shared story lesson. Mims et al. (2009) and Browder et al. (2011) provided verification of inter-rater reliability, procedural fidelity, and social validity which was confirmed via teacher survey. Browder et al. (2011) provided the entire task analyzed program (i.e., all 17 steps) with a coding of engagement or comprehension. Two research questions the authors asked related to the effect of scripted systematic instruction and individually defined responses on (a) the listening comprehension of students with severe, multiple disabilities and (b) on scores of engagement steps on a literacy-based task analysis. Effects were generalized across books during the course of the study.

2.3.3 Research procedures

The most common skill assessed was acquisition of the braille alphabet or Moon Code, all of which are tactile representations of the print alphabet. The Moon Code is more common in the U.K. than in the U.S. as a tactile medium comparable to braille in the U.S. The Moon Code is no

longer supported by the Royal National Institute of Blind People (RNIB, n.d.). Three authors targeted student recognition of individual braille letters, known as un-contracted braille or alphabetic braille as it directly corresponds to the print format as well as the Moon Code (Klenk & Pufpaff, 2011; McCall & McLinden, 2001; Stauffer, 2008). The six children named in the aforementioned studies were able to learn un-contracted braille (or Moon) and all progressed in their ability to recognize letters of the alphabet. McCall and McLinden (2001) chose to incorporate the Moon Code into a specialized reading series titled, *The Moon Cats Reading Scheme.* These individualized stories are comparable to shared stories which were targeted in two similar studies (Browder et al., 2011; Mims et al., 2009). Similarities were also found between McCall and McLinden (2001) and Stauffer (2008). Both used keyboarding techniques to reinforce skills, to aid in the acquisition of braille, and to develop both reading and writing skills. Both authors also relied heavily on auditory feedback, whether computer generated or provided through verbal instructions and praise.

Klenk and Pufpaff (2011) and Stauffer (2008) both chose to use atypical means to develop literacy in their students. Klenk and Pufpaff (2011) used Tack-Tiles in their braille instruction, which are much larger than regular size braille. The student was unable to generalize to paper braille. However, the student's ability to learn letters of the alphabet and trail symbols and names are exceptional feats, given three previous years of instruction in braille that showed little progress (Klenk & Pufpaff, 2011).

Using shared stories to increase and promote comprehension was utilized in two studies (Browder et al., 2011; Mims et al., 2009). The three students involved in both studies increased their number of correct responses when presented with either two choices or improved their

engagement based on a task analyzed program. In Browder et al.'s (2011) article, a 9-year-old girl with aggressive tendencies was the sole participant with an identified VI and multiple disabilities.

The single study introduced prior to NCLB is by Erickson et al. (1997) and focused on an AAC device (Dynavox). The Dynavox was chosen following an AAC assessment for a child who was non-verbal. Auditory scanning was used and then direct selection via a head switch to make choices. More than 200 hours of observation and intervention occurred over two years of instruction. The instructor and parent continued to program words and sentences into the Dynavox according to the student's lessons and personal needs. Eventually, this student began writing self-generated sentences (with spelling errors) and used their own text and thoughts.

Ek et al. (2003) chose to look at acuity improvement and IQ scores for children with Cerebral Visual Impairment (CVI). Four children with CVI participated in this longitudinal study which assessed their vision at ages 4, 13, and 16 as well as IQ scores.

2.3.4 Summary of outcomes

In addition to acquisition of the braille alphabet, five of the six students (83%) were able to transition to simple, familiar words in braille or Moon even though this was not an original intention of the study. Phonics and spelling were introduced during typing lessons by Stauffer (2008). The incorporation of functional academic skills into the lessons helped the student develop a relationship between letter/sound associations and meaningful words. The author reported that the student's recognition of the braille alphabet at baseline was 15.4% or 4 out of 26 letters of the alphabet. Weekly probes continued throughout the six months of instruction. By the sixth month (in May) the student achieved 92% of the braille letters. Regarding maintenance (taken in July), the student performed at 80% accuracy. This can be attributed to a regression due to lack of

summer programming. The student performed at 80% accuracy in maintenance taken six weeks later at the onset of the Extended School Year (ESY) in July. The sixth student (who did not achieve word recognition) was a participant in Klenk and Pufpaff's (2011) study. Their study produced positive results even though they only had eight instructional sessions. Given additional opportunities and exposure to braille, it is anticipated that the student could acquire words and progress to simple sentences as well. During the baseline phase, the student did not recognize any letters of the braille alphabet with the Tack-Tiles. Instead, the instructor provided assistance in hand over hand exploration of the Lego™-like letters. By the fifth session, the student learned 83% of the braille letters using the Tack-Tiles.

Browder et al. (2011) categorized two distinct dependent variables (i.e., comprehension and engagement) which was applied concurrently on each dependent variable. During baseline for comprehension using object cues, the student correctly responded with a mean of .14 and a range of 0-1. The student increased comprehension responses to 4.3 with a range of 0-7 during the intervention. The student's engagement scores at baseline were 6.5 with a range of 0-9. The scores improved to 22.1 with a range of 8-30 during the intervention phase. Generalization and maintenance scores were taken from ten days to one month after the final intervention session. Comprehension scores dropped minimally, but engagement remained steady. Generalization also occurred via location as the student was able to progress from a separate environment into the classroom.

Similarly, Mims et al. (2009) found an increase in comprehension of two students using shared stories paired with object cues. Baseline data (during book 1) revealed that student 1 answered zero questions correctly, with a mean of .75 within a range of 0-3. After intervention, the responses increased to 5 with a range of 1-9. Student 1 also answered less than one correct

response during baseline for book two (.6 with a range of 1-3). Again, the responses increased to 6.5 with a range from 3-8 during the intervention.

Baseline was 1.3 (range from 0-2) increasing to 5.6 (range 1-9) for book 3. Student 2 followed a similar pattern. During baseline for Book I, students correctly answered a mean of 1.75 of the comprehension questions with a range from 0-4. Intervention assisted the responses in increasing to 5.14 (range 2-7). Baseline for Book 2 produced a mean of 2 with a range of 1-4. The intervention resulted in a score of 6.5 with a range of 4-9. Student 2 responded to the intervention for Book 3 by moving from a mean of 2.8 to a mean of 6.25. The range progressed from 1-6 to 4-8, respectively. Numerous teacher strategies such as a system of least prompts as well as the appropriate wait time between questions were utilized. Giving the student's time to tactually explore both objects before making their final choice is crucial in providing them the feedback they need to process their decision.

On the other hand, Ek et al. (2003) found that acuity worsened in the child with CVI and multiple disabilities at age 13, but by age 16 was better than at age 4. The student had an acuity of 20/80 at near distance and was taught braille, albeit unsuccessfully. During a longitudinal study conducted by Erickson et al. (1997), an 11-year-old boy progressed from six squares on his Dynavox to 40 squares during 5th grade alone. Both print and pictures were used to elicit responses.

2.4 Discussion

The purpose of this review was to examine the interventions used in developing literacy for students with multiple disabilities, including visual impairment and to determine student

outcomes based on specific interventions. First, participants and setting will be discussed. Next, designs will be examined. Third, procedures and outcomes will be addressed as well as limitations due to the paucity of research available on the topic. Finally, recommendations for future research will be developed as well as implications for the practitioners in the field of educating students with multiple disabilities, including VI. Overall findings indicate that students with multiple disabilities, including VI are able to learn to read given proper instructional strategies. The introduction of NCLB and changing teacher and societal attitudes regarding the abilities of students with disabilities are providing researchers with an opportunity to explore this population in new ways.

2.5 Research Limitations

2.5.1 Setting and participants

First, it should be noted that there were some limitations to this review. Students with multiple disabilities include students with VI. The manner in which students are described or coded makes it difficult to identify participants in the study with VI. Thus, identification of students was limited to the author's specification. Furthermore, it is expected that more children in these studies could be diagnosed as VI based not only on their diagnoses of multiple disabilities, but also on their diagnosis of cerebral palsy, which is highly correlated with Cortical Visual Impairment (CVI). It is consistently estimated that between 7-10% of students with significant disabilities also have a VI (Towles-Reeves et al., 2009; 2012). All students were not identified specifically with a VI and their data was not useable (Browder et al., 2011; Ek et al., 2003). Klenk and Pufpaff (2011)

label their student with an additional diagnosis of Autism. Given that both VI and Autism are both low incidence disabilities, the statistical likelihood that a child is diagnosed with both conditions is rare (Roman-Lantzy, 2008). For a child with a diagnosis of VI, it is not Autism that leads to communication deficits through a lack of eye contact but rather their lack of vision. These social skills need to be explicitly taught to the child with a visual impairment (Widerstrom et al., 1997). It is their visual impairment that prevents them from learning these concepts incidentally through the use of vision. Children with VI need the world brought to them. They are only able to gather information as far as their vision allows. For some who are totally blind, their world ends at their fingertips unless it is engaged and facilitated by adults, family members, or peers (Bishop, 1996).

2.5.2 Designs

Some designs lacked additional information that would have been beneficial for the reader to acquire (Ek et al., 2003; Erickson et al., 1997; Klenk & Pufpaff, 2011; McCall & McLinden, 2001). Several authors could have been more explicit in describing the selection of participants (Erickson et al., 1997; Klenk & Pufpaff, 2011; McCall & McLinden, 2001; Stauffer, 2008), while others could have adequately described the physical setting with enough precision for others to replicate their study (Ek et al., 2003; McCall & McLinden, 2001). Others adhered to the quality indicators within single-subject research established by Horner et al. (2005; Browder et al., 2011; Mims et al., 2009; Stauffer, 2008) by providing at least three demonstrations of experimental effect at three different points in time, controlling for threats to internal validity, documenting a pattern that demonstrates experimental control, and verifying social validity. Stauffer (2008), Mims et al. (2009), and Browder et al. (2011) all utilized a multiple-probe single case design in order to

determine student progress. In addition, Browder et al. (2011) applied an intervention concurrently across two dependent variables.

2.5.3 Procedures

Several studies organized their information and offered exact replicas of their questions and interventions (Browder et al., 2011; Mims et al., 2009; Stauffer, 2008). Others made omissions to their documentation or made decisions that may have affected the outcome of their study (Ek et al., 2003; Erickson et al., 1997; Klenk & Pufpaff, 2011; McCall & McLinden, 2001). Klenk and Pufpaff (2011) used Tack-Tiles in their instruction, but their student was unable to transfer those skills to paper braille. Tack-Tiles are Lego™-type blocks that can be either individually spaced or strung together to form words onto a frame. They are larger than regular sized braille; therefore, letters learned are not always transferred into paper braille as the authors found to be the case for their student. A longitudinal study encompassing more students may determine the efficacy of other children to generalize to regular braille.

Erickson et al. (1997) did not maintain accurate baseline data, but their results are still impressive for use with AAC. The first year of the study took place in 4th grade and records do not reflect progress as much as they involve assessment and exposure to the curriculum. This student was fortunate enough to have a dedicated team of professionals, including his mother, who was the county-wide inclusion and assistive technology coordinator and an author of this study. This study appears to be written after the student began to show signs of success as data collection was much more stringent in the second year of the study. Ek et al. (2003) measured both visual acuity and IQ. They reported a young girl's acuity as 20/80, within a likely large print reader range, yet they were teaching her braille. The results of a Learning Media Assessment should be

considered and used to determine if the student should learn braille or if the student would actually be a print reader (including large print). In addition, the Wechsler Intelligence Scale for Children (WISC-III) was used to determine cognitive levels. The authors revealed that the participant was unable to perform the assessment and was "too low to be measured" (Ek et al., 2003). Perhaps the WISC is inappropriate to be used for children with visual impairment because it is very visual in nature and is considered an invalid measure of cognitive function for all students with VI.

Due to the brain's remarkable plasticity, children with CVI are often able to reroute neural pathways in their brain and can improve their vision through appropriate and well-planned interventions (Roman-Lantzy, 2008), although the authors of this study attribute it to developing better compensatory strategies or late maturation.

2.5.4 Outcomes

These studies targeted a wide range of interventions, but several studies were not conducted in one particular area that would enable conclusions to be drawn regarding efficacy. There are simply not enough participants in the studies to make a generalization on any intervention posed at least how they were measured at the time. Wright poses an alternative to increasing power in studies for statistical significance, especially for low incidence disabilities, such as individuals with VI:

> Group designs with a low number of participants because of low incidence disabilities become more powerful when methods, such as repeated measures and blocking, reduce the variance that is unrelated to the dependent measure and increase the effect size, which increases power. (Wright, 2010)

She also poses implementing this strategy with previous studies to test for significance and increased power.

In addition to promoting the expanded core curriculum for students with VI, which focuses on life skill development, educators are increasingly concerned with reading (print or braille) since the introduction of NCLB. This is evident in the recent research in the field. For a number of years, it was unlikely that a student with multiple disabilities would be given the opportunity to learn to read. Changing teacher attitudes, societal biases, and parental expectations are tantamount to success (Durando, 2008; Zebehazy, 2014).

Promoting shared stories and keyboarding instruction had a positive effect on the reading abilities of their subjects (Browder et al., 2011; Mims et al., 2009; Stauffer, 2008). These studies only involved four students, but the results were encouraging. Replications are encouraged so that others may demonstrate positive outcomes.

2.6 Recommendations for Future Research and Implications for Practitioners

Although the initial results are encouraging, there are limitations to be noted. The lack of both qualitative and quantitative data makes it difficult to determine student progress to a specific intervention. Due to the paucity of quantitative research found, it is necessary for more research to be conducted in the area of literacy for students with multiple disabilities, inclusive of those with VI. Research needs to be conducted in the areas of both print and braille using the whole word approach to literacy (Wormsley, 2011). The success of shared stories and keyboarding instruction should be replicated to validate the results, inclusive of students from K through 12th grade. Braille is easier and less costly to reproduce than Moon even though Moon was used (although not

invented) first. Louis Braille (who was blinded at a young age) invented the code in 1829, but it was not widely used until after his death in 1852 (National Braille Press, 2021). The authors recognize that limited resources are available in the Moon Code due to the cost of production and the feasibility and popularity of braille in other countries (McCall & McLinden, 2001). The lack of finding Moon in the environment may be a detriment to teaching it. Braille should be considered instead of Moon, as it is easier to produce, most commonly recognized and supported, and is located on signage in the community.

In addition to print and braille, research should also be expanded to include children with CVI. CVI is now the leading cause of VI in the United States as our technology has increased in saving infants with low birth weight (Roman-Lantzy, 2008). These infants are often born with damage to the brain and as a result have a diagnosis of CVI. Many authors did not include students with behavioral disorders in their research or dismissed them from their study. Perhaps, if given a way to communicate, behavior would improve as control over one's environment may lead to a decrease in negative behaviors.

3.0 Methods

The purpose of this inquiry was two-fold: to assess teacher perception on the abilities of students with multiple disabilities and to increase the comfort level of staff in providing literacy instruction for students with multiple disabilities. This impacts their ability to educate young children with multiple disabilities, including visual impairment (VI). It allows them to gain confidence in providing literacy instruction to all of their students. In addition, answering these questions affords administrators a baseline for providing rich, engaging, and appropriate professional development (PD) to its staff. It also guides universities and colleges in developing content-specific pre-service trainings for its future practitioners.

Enhancing literacy for students with VI has a positive effect on their self-esteem (Hong & Erin, 2004). An increased ability to communicate has a direct influence on quality of life. When students can exercise self-determination and have control over their environment, it leads to greater independence. The lack of research for students with multiple disabilities is concerning because the impact of this decision can determine their ability to participate in a full life, including competitive employment. They fully deserve a life of dignity and active participation in their community. In addition, we need to hold teachers accountable for teaching all students measured by high stakes testing. Every Student Succeeds Act (ESSA) addresses all students including those with multiple disabilities. This policy to practice holds expectations that all students are to be taught core content material.

This research expands the literature base for students with multiple disabilities, including VI, and aids in deciding the instructional strategies used to support this special population. This

study was a partial replication of the Durando study from 2008 using both qualitative and quantitative measures.

3.1 Design

Earlier research shows that even though No Child Left Behind (NCLB) emphasizes an increase in literacy for all students as a priority, most teachers are not prepared to provide literacy instruction for students with multiple disabilities (Browder et al., 2009; Durando, 2008). Even though mandated to include literacy instruction in all settings, many teachers (and administrators) feel that life skill instruction is sufficient for those with multiple disabilities. Regardless, we need to hold *all* students and teachers accountable. Durando (2008) conducted a survey of Teachers of the Visually Impaired (TVIs) about the factors they considered when investigating literacy instruction for students with VI and additional disabilities. Only half of the respondents agreed with the statement "reading instruction is appropriate for every student," and more than half agreed with the statement "braille is too difficult for those with multiple disabilities" (Durando, 2008). Students with multiple disabilities have many needs and often literacy instruction is not given a priority. These teacher attitudes and feelings heavily influence the content of Individualized Education Programs (IEPs) including their literacy participation, and perhaps influence parent and para-educator beliefs as well. For these reasons, this study focused on the perception and confidence of staff in supporting literacy instruction for their students with multiple disabilities, including visual impairment.

Teachers' learning is a complex and multifaceted phenomenon, and it is widely assumed that Professional Development (PD) activity influences both teacher beliefs and actions. This

inevitably improves student learning (Villegas-Reimers, 2003). Basma and Savage (2018) conducted a meta-analysis on teacher professional development's impact on student reading achievement. They found a significant effect on teacher professional development on reading measures among elementary aged students. They also showed that shorter PD sessions produced a larger effect size. The quality of the PD was more of an influence than the length of the PD. Although recent research exists for on-line PD for teachers (Trust et al., 2016), this author was increasingly compelled to develop and deliver an on-line module due to the current COVID-19 pandemic. Additional benefits to on-line PD include no travel time or costs incurred for participation and easy accessibility for all staff, especially those in rural areas. This study was delivered completely on-line with an emphasis on convenience and safety for the participants. Guskey (2000) promotes five critical levels of professional development evaluation, four of which were used during this study. The fifth level regards student learning outcomes and would require further research to determine effectiveness. Another attractive quality of Guskey's model is the concept of beginning with the end in mind, like the creation of logic models. A two-month series of PD modules were conducted with TVIs, Speech and Language Pathologists (SLPs), and Instructional Aides (IAs) during the second semester of the 2020-21 school year. All measures were self-reported and relied on participants to determine their own responses.

3.2 Inquiry Questions

The following questions are correlated to four of the five levels of program evaluation according to Guskey (2016). Guskey's levels are written in italics following each question.

1. What effect does an on-line professional development program have on the perception of teachers and support staff in literacy acquisition of students with multiple disabilities, including visual impairment? *(Participants' Reactions, Organization Support and Change)*
2. To what extent does an on-line professional development program impact the confidence of teachers and support staff in providing literacy instruction to students with multiple disabilities, including visual impairment? *(Participants' Learning, Use of New Knowledge and Skills)*

3.3 Setting and Participants

The participants in this study were instructional staff for students with multiple disabilities, including visual impairment, at an approved private school for the blind. Additional disabilities can include cerebral palsy, intellectual disability (scored below 70), or other physical challenges, such as motor impairment, seizure disorders, and other significant health concerns. The sample was recruited from the staff at the Northern Area School (NAS) in Strausburg, PA. The school has a population of around 200 students, served by 31 classroom teachers with TVI licensure or emergency certification from the Pennsylvania Department of Education (PDE).

The foundation for the curriculum used at NAS, titled Functional Outcomes-based Curriculum for Unique Students (FOCUS) comes from two sources: the Pennsylvania Core Standards (Pennsylvania Department of Education, 2015), and the Expanded Core Curriculum (ECC) as identified by the American Foundation for the Blind. The ECC is defined as the body of knowledge and skills needed by students with visual impairments due to their unique disability

(American Foundation for the Blind, 2014) and is a requirement for all students with VI. "A student whose development is impacted by a visual impairment is not a student with less potential than her peers; rather, she is a student who must reach her potential in different ways. FOCUS was developed to embody this commitment to the students and families served by NAS" (FOCUS, 2015).

3.4 Procedures

Prior to the study, the Principal Investigator (PI) received approval from both the Superintendent and the chair of NAS's Educational Benefit Review, the Director of Professional Development. Potential participants were contacted via e-mail that thoroughly outlined the requirements for their participation and included a consent form required by the NAS. The script for the e-mail can be found in Appendix A.

An informational e-mail describing the study was sent to the participants. The e-mail stipulated the following inclusion criteria for participation: (a) they must be a classroom teacher, SLP, or IA at the NAS and (b) they must complete all sessions of the PD plan to qualify for the study. Participants who met the criteria supplied their contact information and a signed consent form for their involvement. This literacy training consent document is in Appendix B.

Prior to completing the presurvey, each participant chose a coded identifier that was known only to them in order to protect confidentiality. Participants were encouraged to save this four-digit code and word combination in the notes section of their phone so they would be able to use the same identifier in the post survey. All data was collected and stored electronically using the online Qualtrics software system required by the University of Pittsburgh.

TVIs, SLPs and IAs were contacted via e-mail to schedule their participation in the study. The participants were instructed to not partake in any additional literacy instruction for PD other than that provided by this author.

3.4.1 Training program

Initially, these trainings were meant to be delivered face to face. However, the pandemic necessitated a full delivery on-line using Zoom. Over the course of two months, participants engaged in three, 45-minute professional development sessions following the structure below (Appendix C)**:**

Review of the Current Literature

Participants will:

- Gain an understanding of the five components of literacy instruction (National Reading Panel & National Institute of Child Health and Human Development, 2000)
- Be provided with several ways to incorporate literacy into daily activities
- Gain an understanding of the benefits of providing literacy instruction to all students

Literacy for All

Participants will be able to:

- Describe the differences between a conventional literacy approach and emergent literacy (National Reading Panel & National Institute of Child Health and Human Development, 2000)
- Describe the instructional benefits to using Universal Core vocabulary
- Identify the instructional components that support literacy for students with Cortical Visual Impairment

Review I-M-ABLE

Participants will:

- Learn the importance of providing a braille rich environment
- Understand the components of braille literacy
- Be able to select key vocabulary words for their students

Participants met live via Zoom for three 45-minute sessions that were recorded in the event they could not attend. All sessions were delivered using a PowerPoint presentation with resources and references included in each training. The first session presented an overview of the research to show the impact literacy instruction has on students with multiple disabilities. Participants had the ability to ask questions following each presentation; however, only one participant asked a question for clarification on incidental learning in the first session. There were no questions posed during subsequent sessions.

A handout on the Universal Core Vocabulary: First 36 (Center for Literacy and Disability Studies, n.d.) was e-mailed to all participants with the recording of the session on Dr. Erickson's work. The third session, reviewing Dr. Wormsley's I-M ABLE approach included three videos that showed natural cuing, hand placement, tracking skills, orientation of materials, and rich verbal descriptions during instruction. In addition, all materials (including the webinars) were provided to the participants and sent to the Director of Professional Development for accessibility via SharePoint. It was preferred that all participants attend the scheduled live Zoom sessions, but they were allowed to watch and re-watch the webinar for clarity.

3.4.2 Survey tools

A pre-survey was administered to participants prior to the first session, which was a review of the current literature**.** The survey was adapted from a survey used in the Durando 2008 study. The pre-survey can be found in Appendix D. In addition to questions related to confidence in providing literacy instruction to students with multiple disabilities, the survey was further enhanced by gathering information on strategies used in classroom instruction prior to the professional development program. The pre-survey included 10 questions on a Likert scale to assess perception on the abilities of students with multiple disabilities, and to increase the comfort level of Teachers of the Visually Impaired (TVIs), Instructional Aides (IAs) and Speech Language Pathologists (SLPs) in providing literacy instruction for students with multiple disabilities. A post-survey was administered at the very end of the training program, which followed the third training session. The post-survey included the same 10 questions as the pre-survey with two additional questions related to supporting reading instruction and attitudinal changes.

Both surveys included a comment section so staff could share their reflections on the professional development program. Several staff sent e-mails expressing their excitement in increasing literacy opportunities for their students. In particular, a TVI and SLP from the same educational team are enthusiastically collaborating on plans for the 21-22 school year.

3.5 Data Analysis

The pre-test and post-test survey data were deciphered using a matched pair analysis to determine changes in individual perception on students' ability and their own confidence level in

providing literacy instruction. Overall, there were 16 pre-surveys and 12 post-surveys. All 12 post-surveys were able to be linked to a pre-survey via the memorized numeric pin and word combination. Formal analyses involved paired comparisons, and the 4 non-paired pre-survey results were only included in initial descriptive summaries.

4.0 Findings

A review of the inquiry questions reminds us that we are evaluating perceptions and confidence level of staff in providing literacy instruction to students with multiple disabilities while using four of the five levels of Guskey's model for evaluating professional development. Specifically, professional development sessions targeted participants' learning, participants' use of new knowledge and skills, participants' reactions, and organization support and change. The fifth level evaluates student outcomes, which will be discussed later in future research.

4.1 Overview of Roles and Experience

A number of items asked respondents about their roles and related experience, as well as gender. All but one respondent was female (94%). The frequencies and percentages of respondents by role is summarized in Table 2.

Table 2. Frequencies and Percentages of Respondents by Role

Role	Frequency (%)
Speech and Language Pathologist	5 (31%)
Instructional Aide	4 (25%)
Teacher of the Visually Impaired (Not Emergency Certified)	4 (25%)
Teacher of the Visually Impaired (Emergency Certified)	3 (19%)

In terms of experience, the sample is fairly split among the four defined roles and is summarized in Figure 1. The distribution is heavily positively skewed, meaning most of the respondents have only a few years of experience, which also varies greatly in terms of range or spread. Due to this, the median and IQR range was determined for years in role as 6.25 (3-14.25). This means the median number of years in role is 6.25, and 50% of the distribution ranges between 3 and 14.25 years.

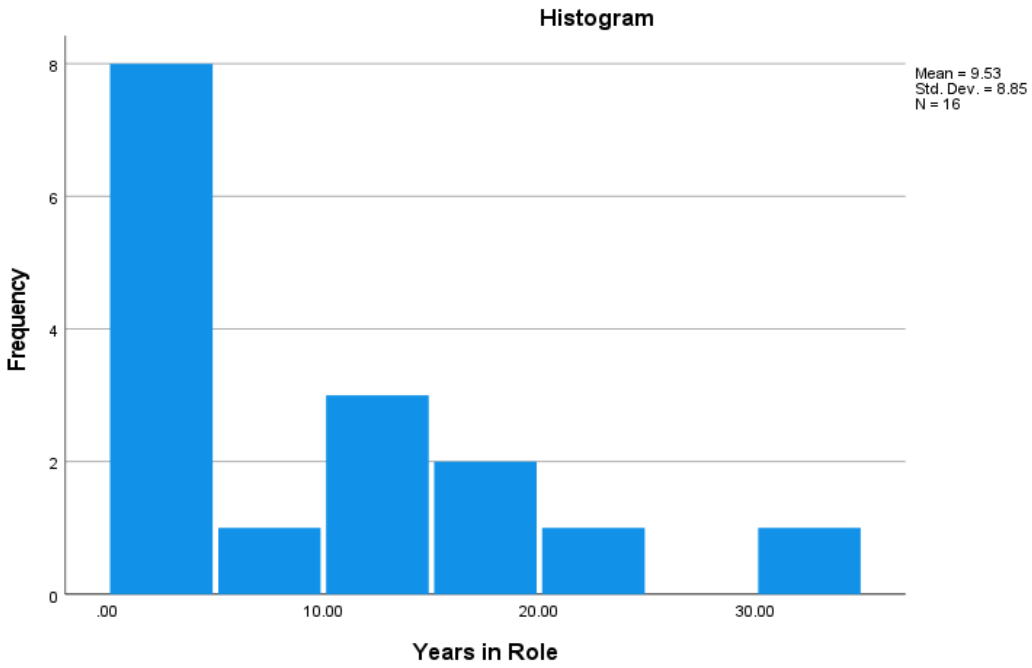

Figure 1. Demographic Information

4.2 What Effect Does an On-Line Professional Development Program Have on the Perception of Teachers and Support Staff in Literacy Acquisition of Students with Multiple Disabilities Including Visual Impairment?

The participants' perceptions in providing literacy instruction to students with multiple disabilities including visual impairment was measured via a pretest and posttest survey. The data from these surveys were extracted from Qualtrics and studied for qualitative analysis. Specifically, the Wilcoxon Signed-Rank test was run for each item. Next, formal hypothesis testing was carried out to see if there was a significant change ($p \leq .05$) in agreement levels between pre-surveys and post-surveys for each of the items summarized in Table 3.

Table 3. Changes in Agreement Level Pre-survey to Post-survey

Item	Z	*p*
Reading instruction is appropriate for every student.	-1.983	0.047
Braille is too difficult for students with multiple disabilities.	-1.186	0.236
Reading skills are prioritized in my students' IEP development.	-2.111	0.035
Literacy instruction is a priority for all of my students.	-1.414	0.157
All of my students have the potential to learn to read with proper instruction.	-1.679	0.093
I feel confident that I am providing high quality literacy instruction to my students.	-2.310	0.021
I possess the knowledge and skills to properly instruct my students in literacy.	-1.890	0.059
Adequate materials and resources are available for me to provide appropriate reading instruction to my students.	-0.333	0.739

Respondents had significantly higher agreement at post-survey compared to pre-survey for the following items: “Reading instruction is appropriate for every student,” with a *p*-value of .047, and “Reading skills are prioritized in my students’ IEP development,” which had a *p*-value of .035. Otherwise, there was not a significant difference found between agreement levels at pre-survey and post-survey for the remaining items. Due to the smaller sample size, there may be true differences or shifts in agreement that could not be detected in this design.

However, some interesting trends were found in reviewing the pre-survey and post-survey data. When asked if “reading instruction is appropriate for every student,” three staff either strongly disagreed or disagreed with the statement prior to the professional development sessions. After the sessions, zero respondents either strongly disagreed or disagreed with that statement. Also, 10 responded that they felt that braille was too difficult for students with multiple disabilities in the pre-survey compared to 7 afterwards.

Distributions of agreement levels for many of the items appear to shift in a more agreeable direction post-survey. A diverging bar plot (Figure 2) is provided below to better visualize the distributions of agreement levels for each item pre-survey and post-survey. The plot is designed so that red bars denote disagreement (with more intense red indicating strong disagreement), and blue bars denote agreement (with more intense blue indicating strong agreement). Red bars stack towards the left side of the axis, and blue bars stack towards the right side of the axis. Neutral responses are colored as gray and are centered at the axis. Also, the items are ordered from highest level of agreement to lowest level of agreement at pre-survey for ease of comparing agreement levels across items.

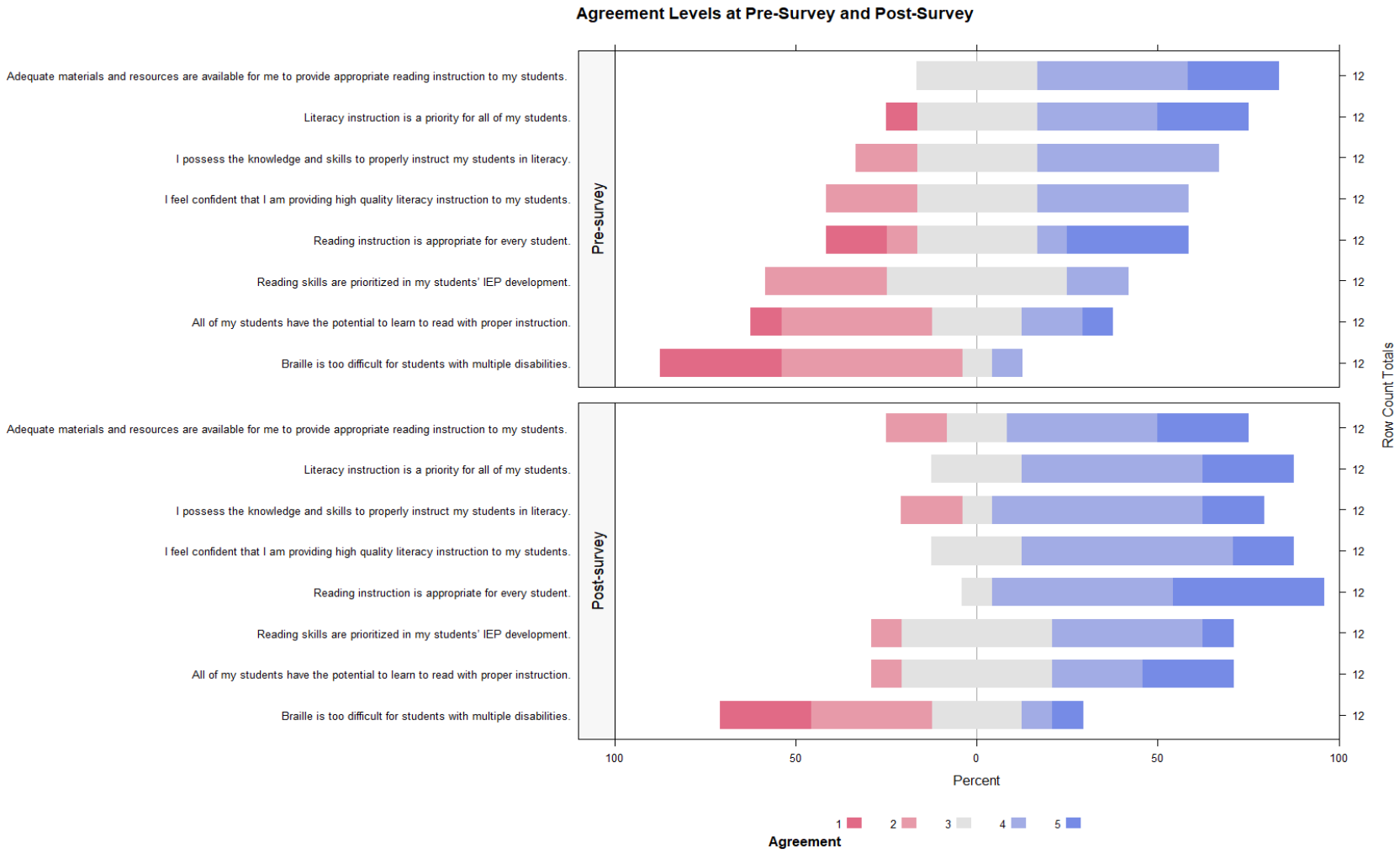

Figure 2. Agreement Levels at Pre-Survey and Post-Survey

At pre-survey, instructional aides gravitated towards giving the middle rating of three or neutral far more than any other role. At post-survey, this role group's ratings shifted more towards the positive end of the scale. While all role groups had observed shifts towards the positive end of the scale, the speech and language pathologists had the most subtle changes and remained largely not in agreement with the statement regarding braille. While both roles of teachers of VI students showed noticeable shifts towards the positive end of the scale, those who were not certified showed the highest magnitude changes. It is worth noting that of the two groups (and overall) that the non-certified teachers had the highest disagreement levels in general at pre-survey (so they had the highest potential for change towards the positive end of the agreement scale).

Subsequently, years in role (Table 4) and the agreement levels for each item both at pre-survey and post-survey were compared through Spearman correlations to see if any significant associations existed, and if so, the magnitude and direction of that association.

Table 4. Years in Role and Agreement Levels

Question	Correlation with Years in Role			
	Pre-Survey		Post-Survey	
	R	p	R	P
Reading instruction is appropriate for every student.	-0.449	0.081	0.092	0.776
Braille is too difficult for students with multiple disabilities.	0.041	0.881	0.140	0.665
Reading skills are prioritized in my students' IEP development.	-0.268	0.315	0.011	0.972
Literacy instruction is a priority for all of my students.	0.066	0.808	0.103	0.750
All of my students have the potential to learn to read with proper instruction.	-0.202	0.454	-0.037	0.909
I feel confident that I am providing high quality literacy instruction to my students.	0.190	0.482	0.006	0.985
I possess the knowledge and skills to properly instruct my students in literacy.	0.194	0.472	0.000	1.000
Adequate materials and resources are available for me to provide appropriate reading instruction to my students.	0.331	0.211	0.485	0.110

None of the correlations were statistically significant, which implies there is not a significant association between years in role and any of the agreement levels for any of the items. It is worth noting that the sample size is quite small, and therefore, even observed moderate correlations do not register as significant in such cases. There are a few correlations which are

noteworthy even if not significant. Specifically, the items regarding reading instruction (at pre-survey) and adequacy of materials (both surveys) had correlations ranging in magnitude from .331 to .485. Also, correlations appeared to mostly be weaker at post-survey compared to pre-survey results (except for the final item, which had a stronger correlation at post-survey). Corresponding scatterplots can be found in Appendices L and M.

4.3 To What Extent Does an On-Line Professional Development Program Impact the Confidence of Teachers and Support Staff in Providing Literacy Instruction to Students with Multiple Disabilities, Including Visual Impairment?

It is this author's belief that when staff feel comfortable and confident in providing literacy instruction, they will embed it into natural routines and throughout the school day. Human nature dictates that when we are unsure or uncomfortable, we tend to avoid those circumstances. By providing teachers the confidence and knowledge they need to provide literacy instruction, we can help numerous children develop literacy. Nine staff responded positively when asked, "I feel confident that I am providing high quality literacy instruction to my students." It was reassuring to see the statistical significance of this comment ($p = .021$) when comparing the pre-survey to the post-survey.

Another question posed to the participants was regarding whether or not they possessed the knowledge and skills to properly instruct their students in literacy. Six agreed with the statement in the pre-survey, while nine agreed with the statement post-survey. Instilling confidence in staff is essential in promoting educational gains for students, especially in literacy.

When asked what they planned on adding to their instructional practices, participants offered some comments. One participant said they will increase braille exposure with a continued focus on vocabulary development. They further explained that they would teach spelling with intention while using the core vocabulary presented in the second session. Another said they felt more familiar with techniques for teaching braille. Another stressed adding assessment into their practice and then progressing symbolic representation into true literacy skills. A respondent (presumed to be an instructional aide) commented that they will discuss this with their teacher when she is back from her leave of absence. Following the professional development sessions, nine respondents agreed or strongly agreed that the presentations would impact how they support reading instruction for their students.

4.3.1 Literacy strategies prior to presentations

A question posed to respondents asked whether they had used literacy strategies in instructional practice prior to these presentations. Of the 16 total respondents, half of them responded yes. If one only looks at the 12 respondents who submitted a post-survey, 7 (58%) responded yes. These findings support the earlier work of Durando (2008) and Zebehazy (2014) where only half of all respondents thought literacy instruction was appropriate for students with multiple disabilities, including visual impairment.

4.3.2 Agreement levels broken down by role and experience

There was not a sufficient sample size to test whether agreement significantly differs across roles, but descriptive summaries are calculated for each role type with regards to agreement levels at pre-survey and post-survey. Years in role was also considered, and correlations and scatterplots are constructed between agreement scores and years in role for each item at each time point and difference across time (pre and post). Agreement levels were plotted (for all respondents) by role using the same diverging plots style as before. One plot is generated for pre-survey responses, and one plot is generated for post-survey responses. General trends are summarized in Figures 3 and 4.

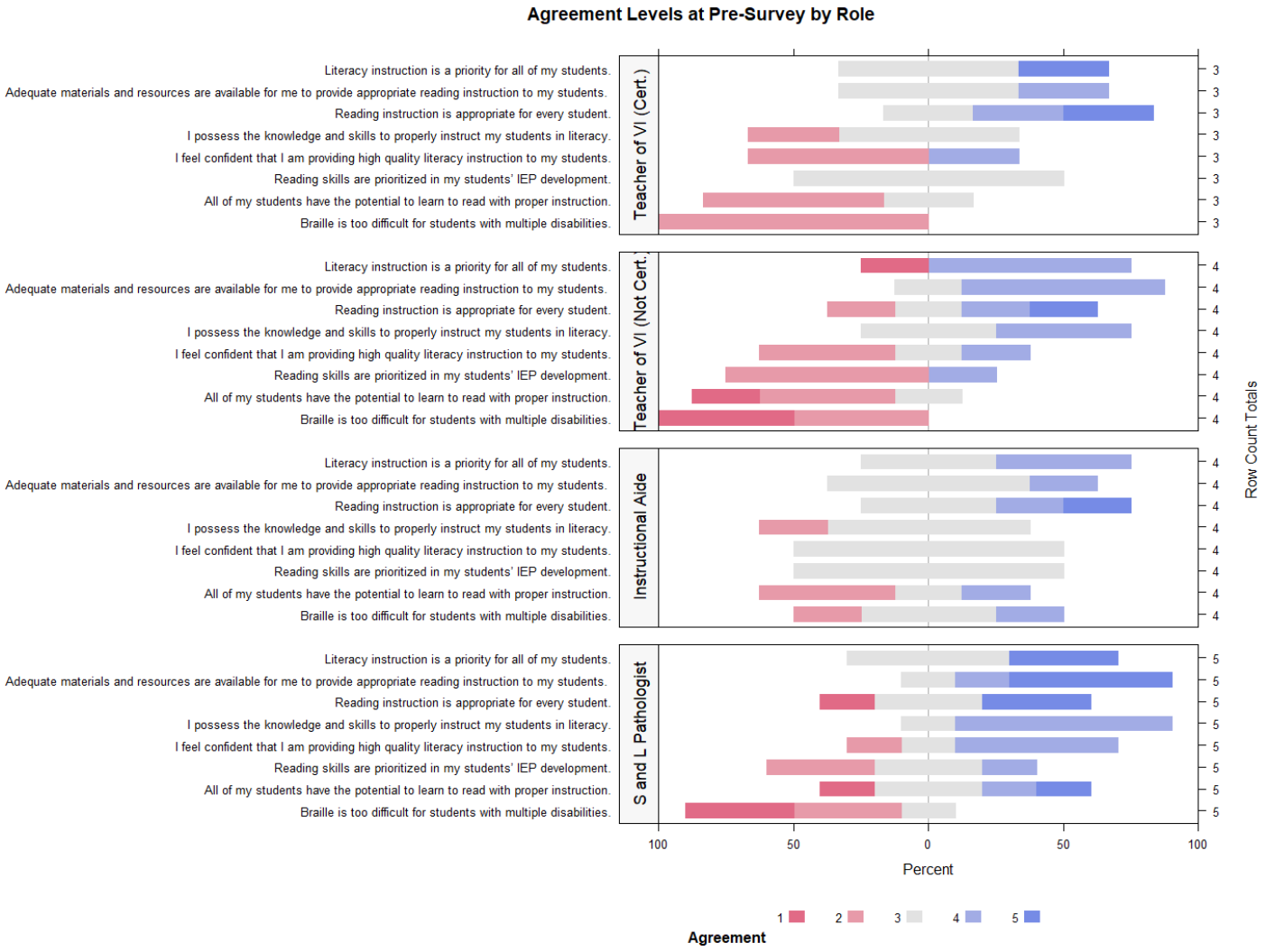

Figure 3. Agreement Levels at Pre-Survey by Role

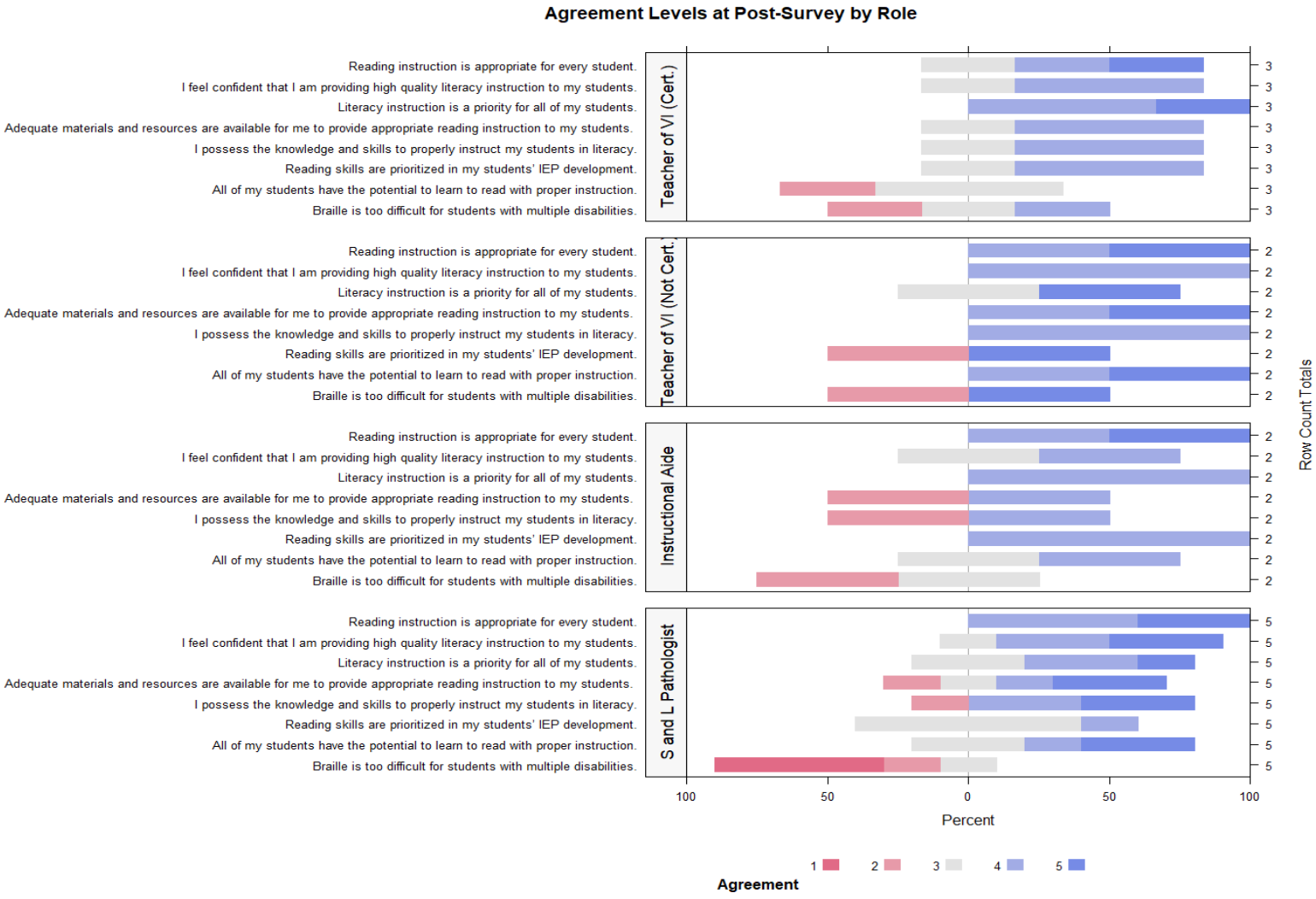

Figure 4. Agreement Levels at Post-Survey by Role

5.0 Discussion

It is interesting that most of the participants only had a few years of experience. This is important to note, especially for TVIs, as they are introduced to Dr. Erickson's work in their pre-service training.

Additionally, SLPs by trade are experts in communication and are heavily trained in Dr. Erikson's approach as well as using the Communication Matrix (Rowland, 2004). This may explain why there was little to no shift in their pre-survey and post-survey data; they already felt that literacy should be prioritized, especially for students with multiple disabilities and VI. To date at NAS, there have not been previous in-service presentations highlighting Dr. Erickson's work nor the ability for SLPs to share their expertise. For the SLPs who participated, the second webinar was a review as revealed in a comment left on the post-survey. "The information confirmed a lot of what I've already learned and was a really great reminder" said a participant I presume was an SLP. "I look forward to learning/finding ways to bring literacy to my students."

Some general observations relate specifically to braille literacy. This item had the highest level of disagreement at both pre-survey and post-survey. Also, there is almost no change between the two surveys for this item. This could be attributed to the fact that there were only three PD sessions. This may not be enough to truly change perceptions, especially for long-held beliefs. Unfortunately, educators are faced with disheartening results on the state assessment when it comes to literacy for students with multiple disabilities. Alternate assessments, designed to be one size fits all, do not appropriately assess those with individualized programming. These repeated messages can negate any positive messaging or progress on their belief system or perception. This could, in turn, affect their confidence as well. One could speculate that individuals still perceive braille as being too difficult for

students with multiple disabilities as established by Durando (2008) and Zebehazy (2014). An additional item regarding having adequate materials had the highest level of agreement at pre-survey and showed little change at time of post-survey. This should be probed a little deeper by asking staff what materials they feel are lacking and procure some for our Curriculum Resource Room. Perhaps they need guidance on locating or purchasing additional materials to support braille literacy.

Hopefully, we can change attitudes and perceptions to enhance literacy skills for students with multiple disabilities. When asked, "all of my students have the potential to learn to read with proper instruction," three participants initially agreed with the statement compared to six in agreement post-survey. These positive trends are encouraging. With continued or mandatory professional development in the area of literacy, we can see a greater impact on perception and thus, hopefully, student performance.

There is a chance that perceptions could be attributed to pre-service training or background experience. It should also be noted that these observed changes are based on a very small number, and the observed differences could be potentially due to natural variation. Of course, confidence increases with experience and practice. Educator support and coaching is vital to student success.

5.1 Limitations

As with all research, this study had limitations. First, readers should use caution when trying to generalize these results to other settings. This is due to the particular setting for the research, the staff role identified for participation, and the small and specific sample. Since the study participants encompassed three different disciplines, a variety of experience, and differences in education, the professional development opportunities could be novel for some and a review for others. Although

the findings are similar to that of the Durando (2008) study, they can only truly represent the experience of the participants in this specific school. It remains important to replicate this study in additional settings to demonstrate consistency and validity among the findings. I would also propose this study be replicated in public school settings as well as additional private schools. This study could be easily replicated by borrowing the webinars that were recorded to present to new participants, including current or additional settings.

Although the initial results are encouraging, there are additional limitations to be noted. Students with multiple disabilities have individualized, specific educational programs and most research may not precisely reflect their needs. Case studies may be more appropriate for this unique population.

In considering the results, perhaps perceptions did not change because training was limited to only three sessions. In addition, those sessions were conducted exclusively online due to the pandemic. On-line professional development is not the preferred method of delivery. It is difficult to discern if participants are truly engaged during Zoom meetings. Typically, in-person sessions garner increased opportunities for collaboration, questions, and reflection.

Another possibility is that the quality of the presentations was not adequate to change longstanding practices and beliefs. With in-person training, the presenter can modify the training according to feedback they receive from participants during the sessions. With only three online training sessions, participants may not ask clarifying questions, and the length of the sessions may not be sufficient to meet their needs. It would be better to establish Professional Learning Communities (PLCs) so staff could share their successes and problem-solve their struggles. This approach creates a more cohesive support system for all staff and greatly benefits students.

Participants had the ability to attend the live session or view the recording. Due to having the sessions on Monday morning, professional staff were available during prep periods, but instructional

aides had other work assignments in transportation. For each session, 11 to 12 staff attended live, but it could not be determined if the participants viewed the video.

Possibly, participation waned because of the time of year. This study took place in the Spring which is typically an extremely busy time of the school year. This unprecedented year created additional challenges and fatigue among staff, and some may be dealing with the effects of both the pandemic and finishing end of the school year paperwork.

Turning to another limitation, the pre-survey benefited from 100% response rate. The post-survey showed only an 81% response. Immediately after the final session and the distribution of the post-survey, I received an email from a participant asking if I knew what her coded identifier was as she did not remember it. I reminded her that it was an anonymous survey, and I could not retrieve the information for her, but asked her to check the notes section in her phone to see if she could find her identifier. I believe that this could have happened to other participants and should be considered a limitation in matching the pre- and post-survey.

Many participants chose “neutral” on the surveys. Perhaps it would have been wise to present a four-step Likert scale to force a choice in one direction or the other. This could provide more valuable information to administrators as they try to gauge the experience and perceptions of their staff on providing literacy instruction for students with multiple disabilities.

5.2 Implications for Future Research

Due to the paucity of research found to date on this topic, more research should be conducted in the area of literacy for students with multiple disabilities, inclusive of those with VI. Research needs to be conducted in the areas of both print and braille using the key word approach to literacy

(Wormsley, 2011). In addition to print and braille, research should also be expanded to include children with CVI. CVI is now the leading cause of VI in the United States as our technology has increased in saving infants with low birth weight (Roman-Lantzy, 2008). These infants are often born with damage to the brain and as a result have a diagnosis of CVI. Many authors did not include students with behavioral disorders in their research or dismissed them from their study. Perhaps, if given a way to communicate, behavior would improve as control over one's environment may lead to a decrease in negative behaviors.

Practitioners in the field are encouraged to collect and interpret data and produce articles that would benefit their peers. For example, if staff embedded an IEP goal on literacy, they could then examine whether this inclusion had a positive impact on student performance on either letter identification or word recognition to enhance some form of literacy.

Although this study was for *current* staff, such studies could have positive implications for *pre-service* training programs if successful strategies can be shared to enhance reading for students with multiple disabilities. Choosing course content about current practices in literacy remains the decision of individual pre-service programs, and there is a wide variability in expectations for future TVIs (Rosenblum et al., 2010).

Unfortunately, many teachers lack the time necessary to share successes in their field. It is time to take the discussions out of the teachers' lounge, commit them to paper, and publish articles for the benefit of teaching literacy to students with multiple disabilities. Another suggestion would be to partner with local universities to help us plan, observe, gather data, and write research to support this extremely important endeavor.

5.3 Conclusion

Although all data did not reach statistical significance, participants viewed themselves as more capable and interested in providing literacy instruction to students with multiple disabilities including visual impairment. With increased support for educators, attitudes and confidence will shift in a positive direction. I would recommend establishing PLCs, a major initiative aligning assessments to curriculum, and increased face-to-face professional development opportunities for educators. If these changes could improve student performance for students with multiple disabilities, the attitudes and perceptions might change.

While this study is encouraging, it is just the beginning. As medical advances improve, more children will survive prematurity (many with additional disabilities) and we need to be well prepared to educate *all* of our children.

Appendix A Introductory Script

Dear Colleagues,

As many of you are aware, I am currently a doctoral candidate at the University of Pittsburgh. I am writing to ask for your help with a small evaluation of upcoming training. The purpose of this research study is to determine how professional development affects your perceptions about teaching students with multiple disabilities, including visual impairment. Teachers of the Visually Impaired (TVIs), Speech and Language Pathologists (SLPs), and Instructional Aides (IAs) are the participants in the study. For that reason, I will be surveying TVIs, SLPs and IAs at the Northern Area School and asking them to complete a brief (approximately 10-minute) questionnaire prior to and following the series of professional development opportunities. We will come together via Zoom for three 45-minute sessions that will be recorded in the event you cannot attend. It is preferred that all participants attend the scheduled live Zoom sessions, but you will be permitted to watch and re-watch the webinar. In addition, all materials will be provided to you via SharePoint. There will be no compensation for your participation in this study.

If you are willing to participate, the questionnaire will ask about your role, years of experience, and perceptions regarding literacy instruction for your students with multiple disabilities, including visual impairment. There are no foreseeable risks associated with this project, nor are there any direct benefits to you.

All surveys will be anonymous via the use of a four-digit code of your choice, so I will not know your identity. Please save this code so that you can recall it to complete the post test. Responses to all surveys will be kept in a password-protected webservice, and all data analysis files will be kept in password-protected files. When data are shared, they will be anonymous.

Your participation is completely voluntary, and you may end participation at any time. If you withdraw, your data up until the time of your withdrawal will be maintained, but incomplete data sets will not be used in the final analysis.

This study is being conducted by Rachelle Rectenwald, who can be reached at 412-897-3661, if you have any questions or concerns. I thank you immensely, in advance, for your time.

Appendix B Data Collection Timeline

Synchronous Sessions (Feb-May)			
	Distribute Pre-test Training Session #1: Review of the Current Literature	Training Session #2: Literacy for All Erickson & Koppenhaver (2020) Training Session	Training Session #3: Review I-M- ABLE (Siu, 2016) Distribute Post-test

Appendix C Learner Objectives

I. Review of the Current Literature

Participants will:

- Gain an understanding of the five components of literacy instruction (National Reading Panel & National Institute of Child Health and Human Development, 2000)
- Be provided with several ways to incorporate literacy into daily activities
- Gain an understanding of the benefits of providing literacy instruction to all students

II. Literacy for All

Participants will be able to:

- Describe the characteristics of a conventional literacy approach and emergent literacy as identified by the National Reading Panel and National Institute of Child Health and Human Development, 2000
- Describe the instructional benefits to using Universal Core vocabulary
- Identify the instructional components that support literacy for students with Cortical Visual Impairment

III. Review I-M-ABLE

Participants will:

- Learn the importance of providing a braille rich environment
- Understand the components of braille literacy
- Be able to select key vocabulary words for their students

Appendix D Pre-Survey

Your role: Teacher of the Visually Impaired Emergency Certified? Y or N

Speech and Language Pathologist

Instructional Aide

Years of Service in Role:

Gender: Male Female Prefer not to answer

Please indicate the degree to which you agree with each of the statements with 1 being Strongly Disagree and 5 being Strongly Agree

1. Reading instruction is appropriate for every student.

Strongly Disagree		Neutral		Strongly Agree
1	2	3	4	5

2. Braille is too difficult for students with multiple disabilities.

Strongly Disagree		Neutral		Strongly Agree
1	2	3	4	5

3. Reading skills are prioritized in my students' IEP development.

Strongly Disagree		Neutral		Strongly Agree
1	2	3	4	5

4. Literacy instruction is a priority for all of my students.

Strongly Disagree		Neutral		Strongly Agree
1	2	3	4	5

5. All of my students have the potential to learn to read with proper instruction.

Strongly Disagree		Neutral		Strongly Agree
1	2	3	4	5

6. I feel confident that I am providing high quality literacy instruction to my students.

Strongly Disagree		Neutral		Strongly Agree
1	2	3	4	5

7. I possess the knowledge and skills to properly instruct my students in literacy.

Strongly Disagree		Neutral		Strongly Agree
1	2	3	4	5

8. Adequate materials and resources are available for me to provide appropriate reading instruction to my students.

Strongly Disagree		Neutral		Strongly Agree
1	2	3	4	5

9. Did you use any of the literacy strategies in your instructional practices prior to these presentations? Yes or No

10. If so, which one/s? Literacy for all, Erickson

I-M ABLE, Wormsley

Other: _____

Comments:

Appendix E Post-Survey

Your role: Teacher of the Visually Impaired Emergency Certified? Y or N

Speech and Language Pathologist

Instructional Aide

Years of Service in Role:

Gender: Male Female Prefer not to answer

Please indicate the degree to which you agree with each of the statements with 1 being Strongly Disagree and 5 being Strongly Agree

1. Reading instruction is appropriate for every student.

Strongly Disagree		Neutral		Strongly Agree
1	2	3	4	5

2. Braille is too difficult for students with multiple disabilities.

Strongly Disagree		Neutral		Strongly Agree
1	2	3	4	5

3. Reading skills are prioritized in my students' IEP development.

Strongly Disagree		Neutral		Strongly Agree
1	2	3	4	5

4. Literacy instruction is a priority for all of my students.

Strongly Disagree		Neutral		Strongly Agree
1	2	3	4	5

5. All of my students have the potential to learn to read with proper instruction.

Strongly Disagree		Neutral		Strongly Agree
1	2	3	4	5

6. I feel confident that I am providing high quality literacy instruction to my students.

Strongly Disagree		Neutral		Strongly Agree
1	2	3	4	5

7. I possess the knowledge and skills to properly instruct my students in literacy.

Strongly Disagree		Neutral		Strongly Agree
1	2	3	4	5

8. Adequate materials and resources are available for me to provide appropriate reading instruction to my students.

Strongly Disagree		Neutral		Strongly Agree
1	2	3	4	5

9. Did you use any of the literacy strategies in your instructional practices prior to these presentations? Yes or No

10. If so, which one/s? Literacy for all, Erickson

    I-M ABLE, Wormsley

    Other: _____

11. What new information from the presentation do you plan to apply in your caseload, if any?

12. The information from the presentations will impact how I support reading instruction.

Strongly Disagree		Neutral		Strongly Agree
1	2	3	4	5

Comments:

Appendix F Summary of Likert Item Responses (All Respondents)

A descriptive table for all responses is provided below, but any further analyses or plots will be focused on the matched set of 12 participants who completed both the pre-survey and post-survey.

Table 5. Summary of Likert Responses (All Respondents)

Pre-Survey Question (N = 16)	Rating				
	1	2	3	4	5
	Strongly Disagree		Neutral		Strongly Agree
Reading instruction is appropriate for every student.	2 (13%)	1 (6%)	6 (38%)	3 (19%)	4 (25%)
Braille is too difficult for students with multiple disabilities.	4 (25%)	8 (50%)	3 (19%)	1 (6%)	0 (0%)
Reading skills are prioritized in my students' IEP development.	0 (0%)	5 (31%)	9 (56%)	2 (13%)	0 (0%)
Literacy instruction is a priority for all of my students.	1 (6%)	0 (0%)	7 (44%)	5 (31%)	3 (19%)

Table 5 (continued)

All of my students have the potential to learn to read with proper instruction.	2 (13%)	6 (38%)	5 (31%)	2 (13%)	1 (6%)
I feel confident that I am providing high quality literacy instruction to my students.	0 (0%)	5 (31%)	6 (38%)	5 (31%)	0 (0%)
I possess the knowledge and skills to properly instruct my students in literacy.	0 (0%)	2 (13%)	8 (50%)	6 (38%)	0 (0%)
Adequate materials and resources are available for me to provide appropriate reading instruction to my students.	0 (0%)	0 (0%)	7 (44%)	6 (38%)	3 (19%)

Post-Survey Question (N = 12)	Rating				
	1	2	3	4	5
	Strongly Disagree		Neutral		Strongly Agree
Reading instruction is appropriate for every student.	0 (0%)	0 (0%)	1 (6%)	6 (38%)	5 (31%)
Braille is too difficult for students with multiple disabilities.	3 (19%)	4 (25%)	3 (19%)	1 (6%)	1 (6%)
Reading skills are prioritized in my students' IEP development.	0 (0%)	1 (6%)	5 (31%)	5 (31%)	1 (6%)
Literacy instruction is a priority for all of my students.	0 (0%)	0 (0%)	3 (19%)	6 (38%)	3 (19%)

Table 5 (continued)

All of my students have the potential to learn to read with proper instruction.	0 (0%)	1 (6%)	5 (31%)	3 (19%)	3 (19%)
I feel confident that I am providing high quality literacy instruction to my students.	0 (0%)	0 (0%)	3 (19%)	7 (44%)	2 (13%)
I possess the knowledge and skills to properly instruct my students in literacy.	0 (0%)	2 (13%)	1 (6%)	7 (44%)	2 (13%)
Adequate materials and resources are available for me to provide appropriate reading instruction to my students.	0 (0%)	2 (13%)	2 (13%)	5 (31%)	3 (19%)

Appendix G Summary of Likert Item Responses (Paired Respondents)

Two descriptive tables for the matched set of 12 participants who completed both the pre-survey and post-survey are provided below:

Table 6. Summary of Likert Item Responses (Paired Respondents)

Pre-Survey Question (N = 12)	Rating				
	1	2	3	4	5
	Strongly Disagree		Neutral		Strongly Agree
Reading instruction is appropriate for every student.	2 (13%)	1 (6%)	4 (25%)	1 (6%)	4 (25%)
Braille is too difficult for students with multiple disabilities.	4 (25%)	6 (38%)	1 (6%)	1 (6%)	0 (0%)
Reading skills are prioritized in my students' IEP development.	0 (0%)	4 (25%)	6 (38%)	2 (13%)	0 (0%)
Literacy instruction is a priority for all of my students.	1 (6%)	0 (0%)	4 (25%)	4 (25%)	3 (19%)

Table 6 (continued)

All of my students have the potential to learn to read with proper instruction.	1 (6%)	5 (31%)	3 (19%)	2 (13%)	1 (6%)
I feel confident that I am providing high quality literacy instruction to my students.	0 (0%)	3 (19%)	4 (25%)	5 (31%)	0 (0%)
I possess the knowledge and skills to properly instruct my students in literacy.	0 (0%)	2 (13%)	4 (25%)	6 (38%)	0 (0%)
Adequate materials and resources are available for me to provide appropriate reading instruction to my students.	0 (0%)	0 (0%)	4 (25%)	5 (31%)	3 (19%)

Post-Survey Question (N = 12)	Rating				
	1	2	3	4	5
	Strongly Disagree		Neutral		Strongly Agree
Reading instruction is appropriate for every student.	0 (0%)	0 (0%)	1 (6%)	6 (38%)	5 (31%)
Braille is too difficult for students with multiple disabilities.	3 (19%)	4 (25%)	3 (19%)	1 (6%)	1 (6%)
Reading skills are prioritized in my students' IEP development.	0 (0%)	1 (6%)	5 (31%)	5 (31%)	1 (6%)
Literacy instruction is a priority for all of my students.	0 (0%)	0 (0%)	3 (19%)	6 (38%)	3 (19%)

Table 6 (continued)

All of my students have the potential to learn to read with proper instruction.	0 (0%)	1 (6%)	5 (31%)	3 (19%)	3 (19%)
I feel confident that I am providing high quality literacy instruction to my students.	0 (0%)	0 (0%)	3 (19%)	7 (44%)	2 (13%)
I possess the knowledge and skills to properly instruct my students in literacy.	0 (0%)	2 (13%)	1 (6%)	7 (44%)	2 (13%)
Adequate materials and resources are available for me to provide appropriate reading instruction to my students.	0 (0%)	2 (13%)	2 (13%)	5 (31%)	3 (19%)

Item	Average Agreement Rating (SD)	
	Pre-Survey	Post-Survey
Reading instruction is appropriate for every student.	3.33 (1.50)	4.33 (0.65)
Braille is too difficult for students with multiple disabilities.	1.92 (0.90)	2.42 (1.24)
Reading skills are prioritized in my students' IEP development.	2.83 (0.72)	3.50 (0.80)
Literacy instruction is a priority for all of my students.	3.67 (1.15)	4.00 (0.74)
All of my students have the potential to learn to read with proper instruction.	2.75 (1.14)	3.67 (0.98)
I feel confident that I am providing high quality literacy instruction to my students.	3.17 (0.83)	3.92 (0.67)
I possess the knowledge and skills to properly instruct my students in literacy.	3.33 (0.78)	3.75 (0.97)
Adequate materials and resources are available for me to provide appropriate reading instruction to my students.	3.92 (0.79)	3.75 (1.06)

Appendix H Statistical Significance

Formal hypothesis testing was carried out to see if there was a significant change in agreement levels between pre-surveys and post-surveys for each of the items summarized above. Specifically, the Wilcoxon Signed Rank test was run for each item.

Table 7. Statistical Significance

Item	Z	P
Reading instruction is appropriate for every student.	-1.983	0.047
Braille is too difficult for students with multiple disabilities.	-1.186	0.236
Reading skills are prioritized in my students' IEP development.	-2.111	0.035
Literacy instruction is a priority for all of my students.	-1.414	0.157
All of my students have the potential to learn to read with proper instruction.	-1.679	0.093
I feel confident that I am providing high quality literacy instruction to my students.	-2.310	0.021
I possess the knowledge and skills to properly instruct my students in literacy.	-1.890	0.059
Adequate materials and resources are available for me to provide appropriate reading instruction to my students.	-0.333	0.739

Appendix I Years in Role Correlations

Years in role and the agreement levels for each item both at pre-survey and post-survey were compared through Spearman correlations to see if any significant associations existed, and if so, what the magnitude and direction of that association is.

Table 8. Years in Role Correlations

Question	Correlation with Years in Role			
	Pre-Survey		Post-Survey	
	r	p	r	p
Reading instruction is appropriate for every student.	-0.449	0.081	0.092	0.776
Braille is too difficult for students with multiple disabilities.	0.041	0.881	0.140	0.665
Reading skills are prioritized in my students' IEP development.	-0.268	0.315	0.011	0.972
Literacy instruction is a priority for all of my students.	0.066	0.808	0.103	0.750
All of my students have the potential to learn to read with proper instruction.	-0.202	0.454	-0.037	0.909
I feel confident that I am providing high quality literacy instruction to my students.	0.190	0.482	0.006	0.985
I possess the knowledge and skills to properly instruct my students in literacy.	0.194	0.472	0.000	1.000
Adequate materials and resources are available for me to provide appropriate reading instruction to my students.	0.331	0.211	0.485	0.110

Appendix J Agreement Rating Frequencies by Role

Table 9. Agreement Rating Frequencies by Role

Pre-Survey Question (N = 16)	Teacher of Visually Impaired (Emergency Certified) (N = 3)				
	1	2	3	4	5
	Strongly Disagree		Neutral		Strongly Agree
Reading instruction is appropriate for every student.	0	0	1	1	1
Braille is too difficult for students with multiple disabilities.	0	3	0	0	0
Reading skills are prioritized in my students' IEP development.	0	0	3	0	0
Literacy instruction is a priority for all of my students.	0	0	2	0	1
All of my students have the potential to learn to read with proper instruction.	0	2	1	0	0
I feel confident that I am providing high quality literacy instruction to my students.	0	2	0	1	0
I possess the knowledge and skills to properly instruct my students in literacy.	0	1	2	0	0
Adequate materials and resources are available for me to provide appropriate reading instruction to my students.	0	0	2	1	0
	Teacher of Visually Impaired (Not Emergency Certified) (N = 4)				
Reading instruction is appropriate for every student.	0	1	1	1	1
Braille is too difficult for students with multiple disabilities.	2	2	0	0	0

Table 9 (continued)

Reading skills are prioritized in my students' IEP development.	0	3	0	1	0
Literacy instruction is a priority for all of my students.	1	0	0	3	0
All of my students have the potential to learn to read with proper instruction.	1	2	1	0	0
I feel confident that I am providing high quality literacy instruction to my students.	0	2	1	1	0
I possess the knowledge and skills to properly instruct my students in literacy.	0	0	2	2	0
Adequate materials and resources are available for me to provide appropriate reading instruction to my students.	0	0	1	3	0
	Instructional Aide (N = 4)				
Reading instruction is appropriate for every student.	0	0	2	1	1
Braille is too difficult for students with multiple disabilities.	0	1	2	1	0
Reading skills are prioritized in my students' IEP development.	0	0	4	0	0
Literacy instruction is a priority for all of my students.	0	0	2	2	0
All of my students have the potential to learn to read with proper instruction.	0	2	1	1	0
I feel confident that I am providing high quality literacy instruction to my students.	0	0	4	0	0
I possess the knowledge and skills to properly instruct my students in literacy.	0	1	3	0	0
Adequate materials and resources are available for me to provide appropriate reading instruction to my students.	0	0	3	1	0
	Speech and Language Pathologist (N = 5)				
Reading instruction is appropriate for every student.	1	0	2	0	2

Table 9 (continued)

Braille is too difficult for students with multiple disabilities.	2	2	1	0	0
Reading skills are prioritized in my students' IEP development.	0	2	2	1	0
Literacy instruction is a priority for all of my students.	0	0	3	0	2
All of my students have the potential to learn to read with proper instruction.	1	0	2	1	1
I feel confident that I am providing high quality literacy instruction to my students.	0	1	1	3	0
I possess the knowledge and skills to properly instruct my students in literacy.	0	0	1	4	0
Adequate materials and resources are available for me to provide appropriate reading instruction to my students.	0	0	1	1	3

Appendix K Agreement Rating by Role

Table 10. Agreement Rating by Role

Post-Survey Question (N = 12)	Teacher of Visually Impaired (Emergency Certified) (N = 3)				
	1	2	3	4	5
	Strongly Disagree		Neutral		Strongly Agree
Reading instruction is appropriate for every student.	0	0	1	1	1
Braille is too difficult for students with multiple disabilities.	0	1	1	1	0
Reading skills are prioritized in my students' IEP development.	0	0	1	2	0
Literacy instruction is a priority for all of my students.	0	0	0	2	1
All of my students have the potential to learn to read with proper instruction.	0	1	2	0	0
I feel confident that I am providing high quality literacy instruction to my students.	0	0	1	2	0

Table 10 (continued)

I possess the knowledge and skills to properly instruct my students in literacy.	0	0	1	2	0
Adequate materials and resources are available for me to provide appropriate reading instruction to my students.	0	0	1	2	0
	Teacher of Visually Impaired (Not Emergency Certified) (N = 2)				
Reading instruction is appropriate for every student.	0	0	0	1	1
Braille is too difficult for students with multiple disabilities.	0	1	0	0	1
Reading skills are prioritized in my students' IEP development.	0	1	0	0	1
Literacy instruction is a priority for all of my students.	0	0	1	0	1
All of my students have the potential to learn to read with proper instruction.	0	0	0	1	1
I feel confident that I am providing high quality literacy instruction to my students.	0	0	0	2	0
I possess the knowledge and skills to properly instruct my students in literacy.	0	0	0	2	0
Adequate materials and resources are available for me to provide appropriate reading instruction to my students.	0	0	0	1	1
	Instructional Aide (N = 2)				
Reading instruction is appropriate for every student.	0	0	0	1	1

Table 10 (continued)

Braille is too difficult for students with multiple disabilities.	0	1	1	0	0
Reading skills are prioritized in my students' IEP development.	0	0	0	2	0
Literacy instruction is a priority for all of my students.	0	0	0	2	0
All of my students have the potential to learn to read with proper instruction.	0	0	1	1	0
I feel confident that I am providing high quality literacy instruction to my students.	0	0	1	1	0
I possess the knowledge and skills to properly instruct my students in literacy.	0	1	0	1	0
Adequate materials and resources are available for me to provide appropriate reading instruction to my students.	0	1	0	1	0
	Speech and Language Pathologist (N = 5)				
Reading instruction is appropriate for every student.	0	0	0	3	2
Braille is too difficult for students with multiple disabilities.	3	1	1	0	0
Reading skills are prioritized in my students' IEP development.	0	0	4	1	0
Literacy instruction is a priority for all of my students.	0	0	2	2	1
All of my students have the potential to learn to read with proper instruction.	0	0	2	1	2

Table 10 (continued)

I feel confident that I am providing high quality literacy instruction to my students.	0	0	1	2	2
I possess the knowledge and skills to properly instruct my students in literacy.	0	1	0	2	2
Adequate materials and resources are available for me to provide appropriate reading instruction to my students.	0	1	1	1	2

Appendix L Scatterplots of Years in Role with Agreement Levels by Pre-Survey Item

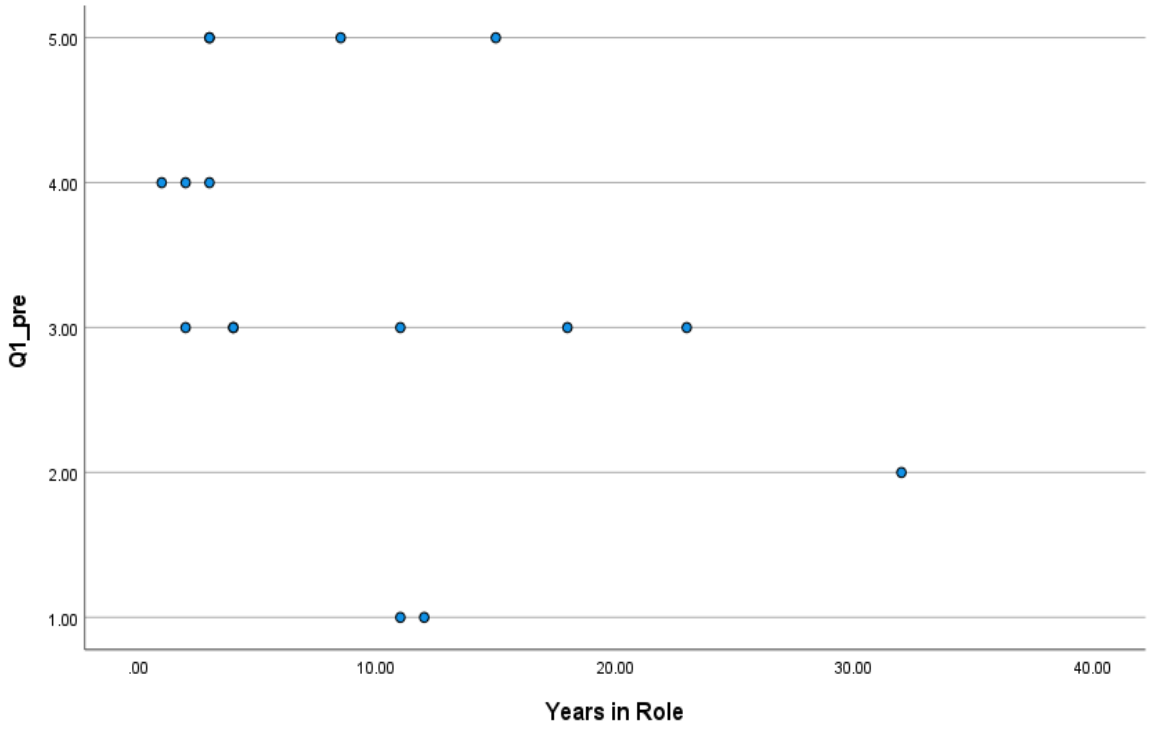

Figure 5. Question 1 Pre-Survey

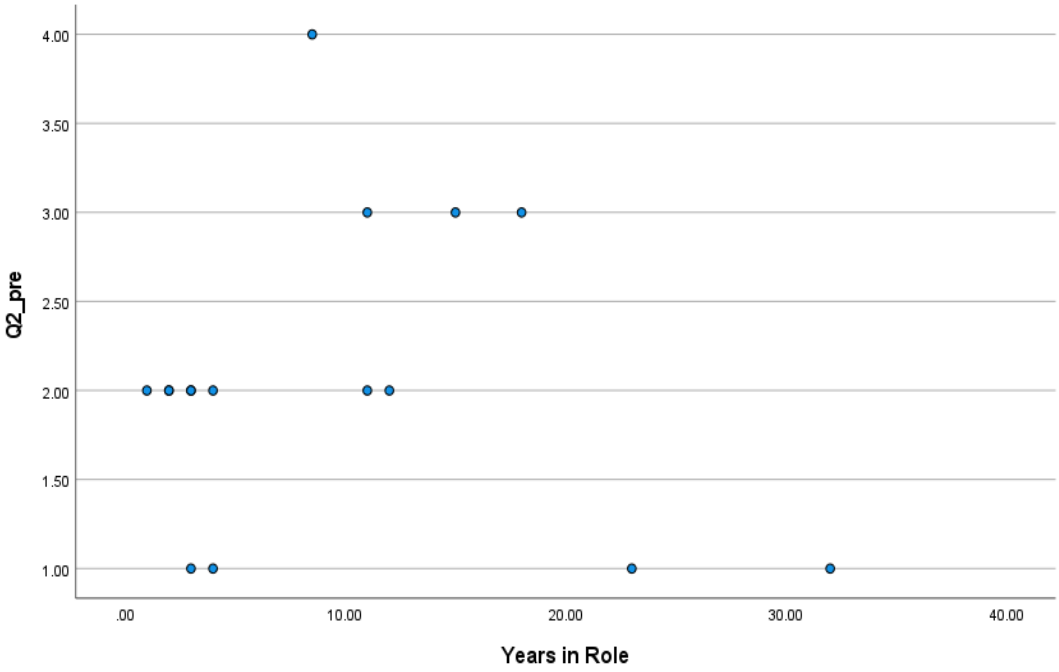

Figure 6. Question 2 Pre-Survey

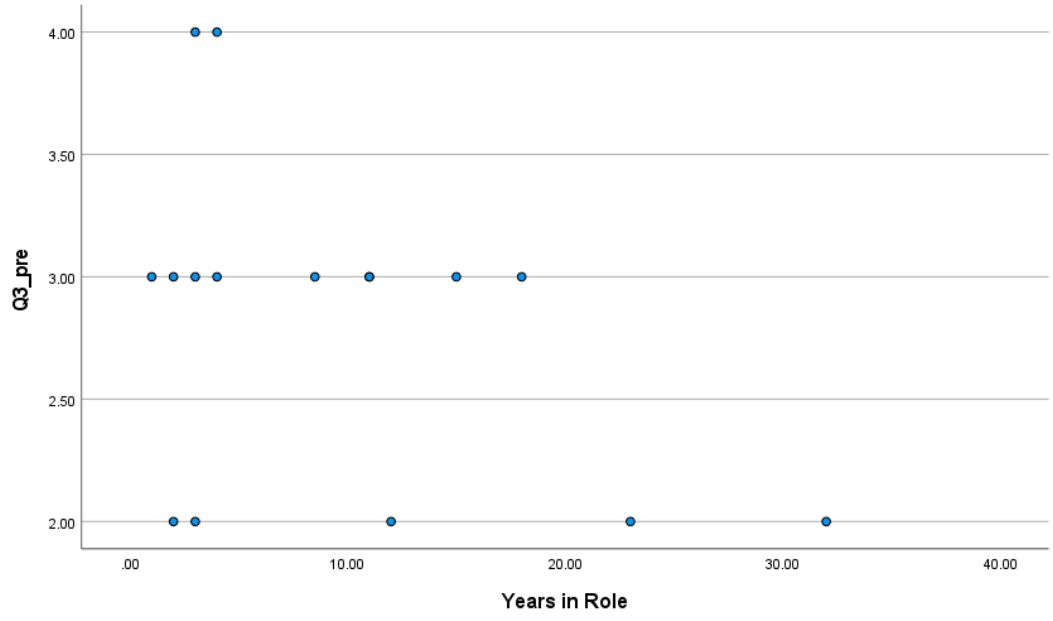

Figure 7. Question 3 Pre-Survey

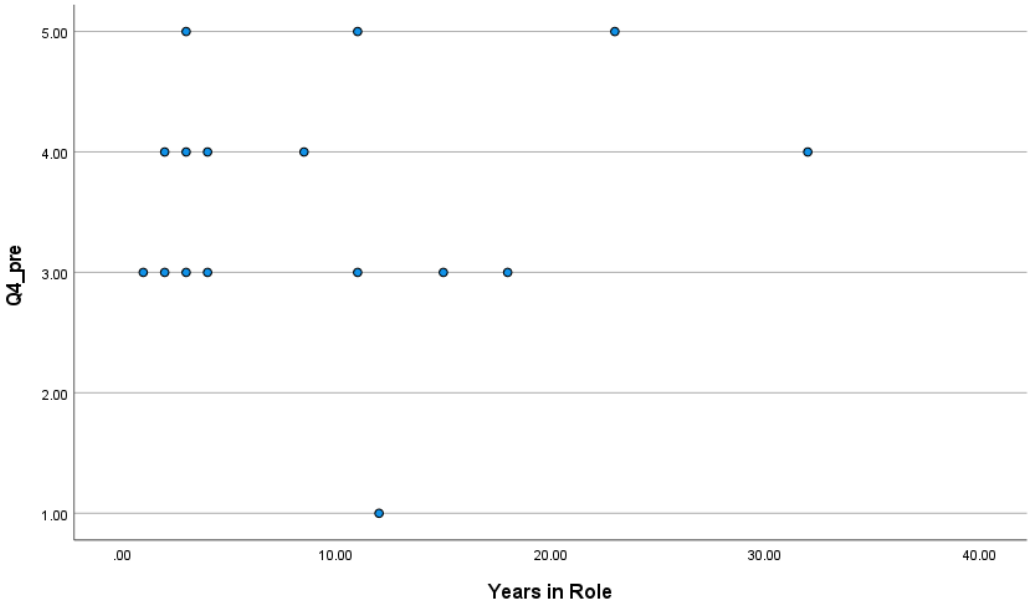

Figure 8. Question 4 Pre-Survey

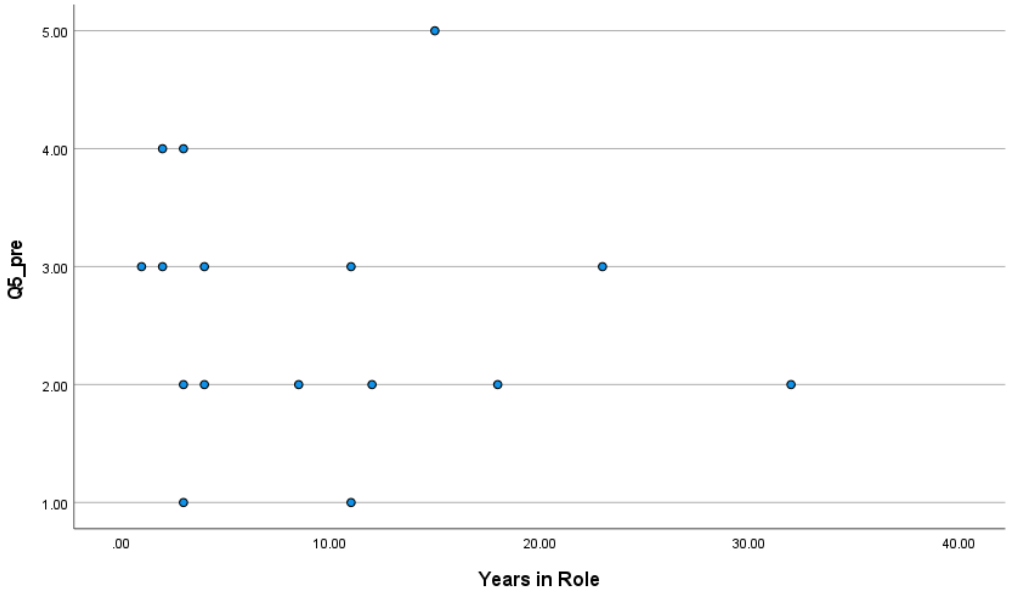

Figure 9. Question 5 Pre-Survey

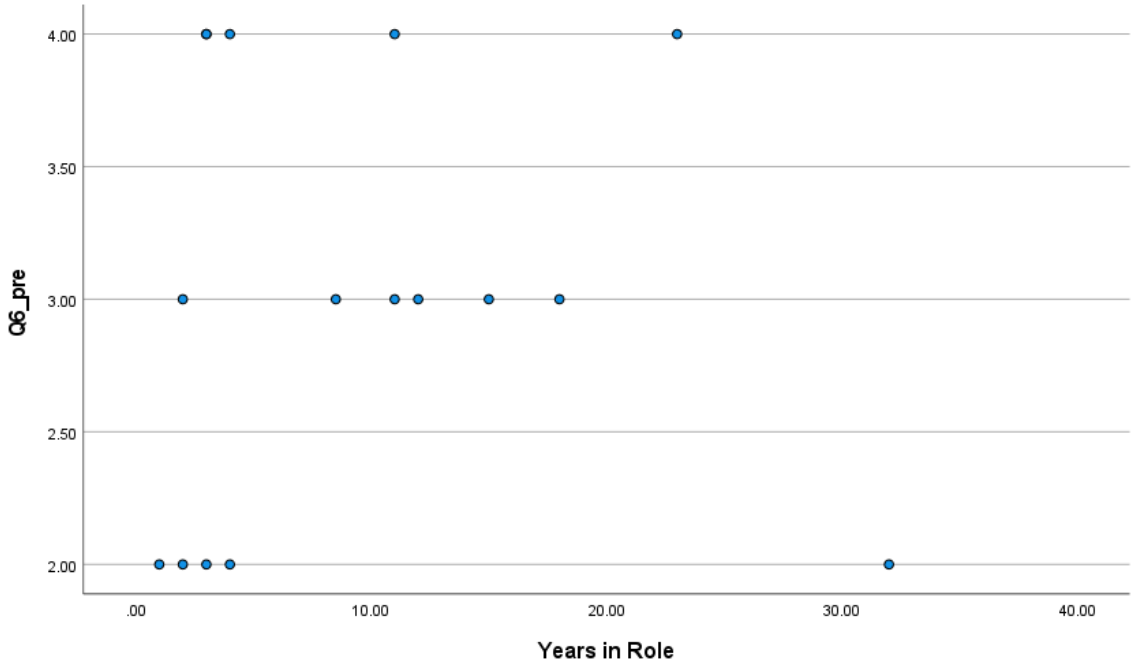

Figure 10. Question 6 Pre-Survey

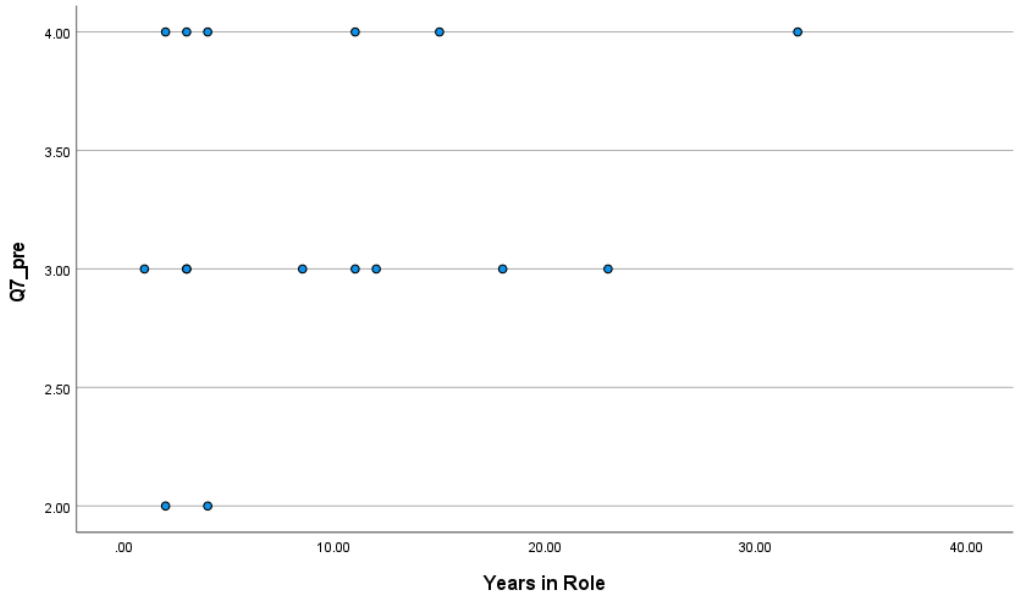

Figure 11. Question 7 Pre-Survey

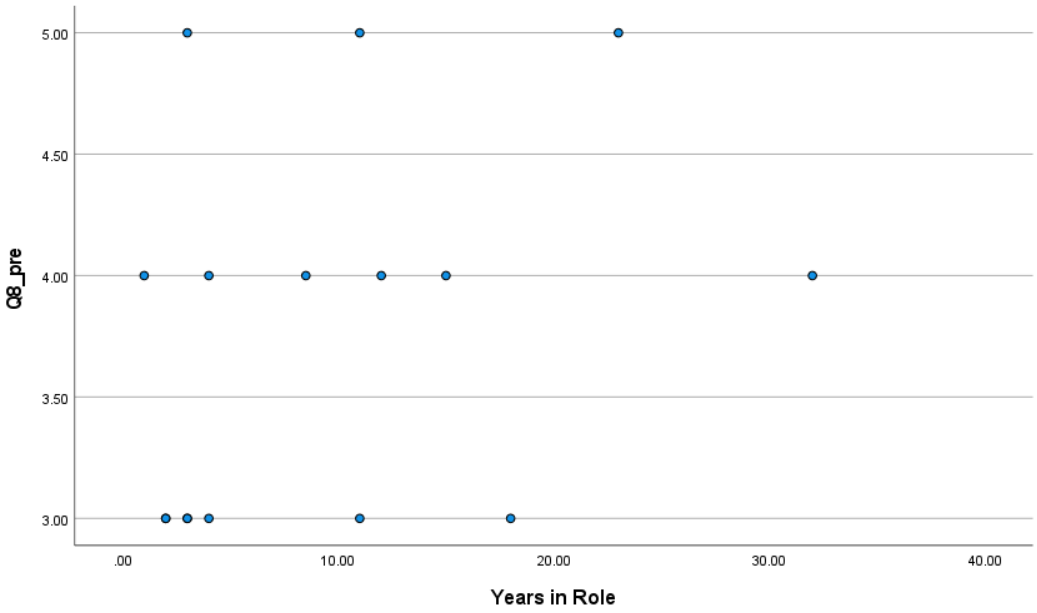

Figure 12. Question 8 Pre-Survey

Appendix M Scatterplots of Years in Role with Agreement Levels by Post-Survey Item

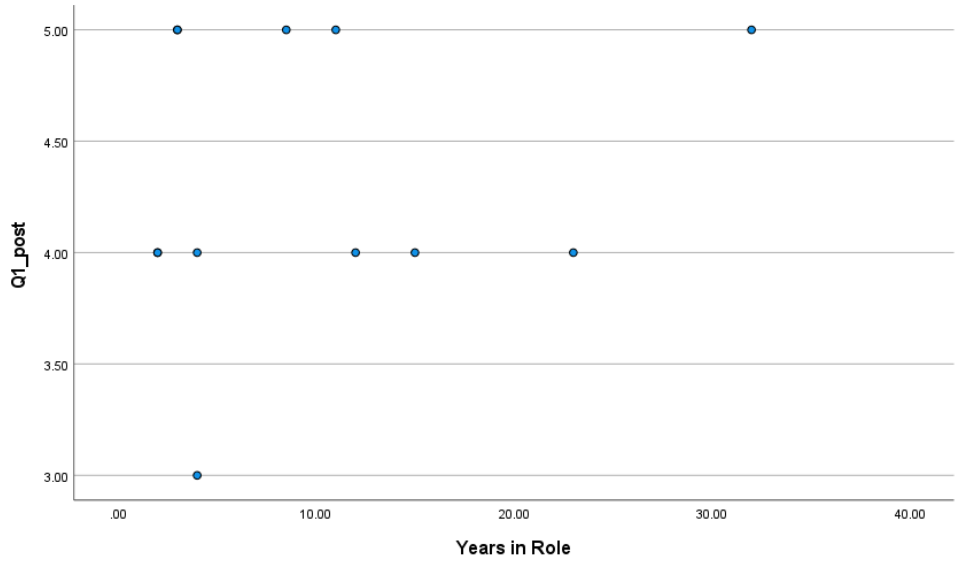

Figure 13. Question 1 Post-Survey

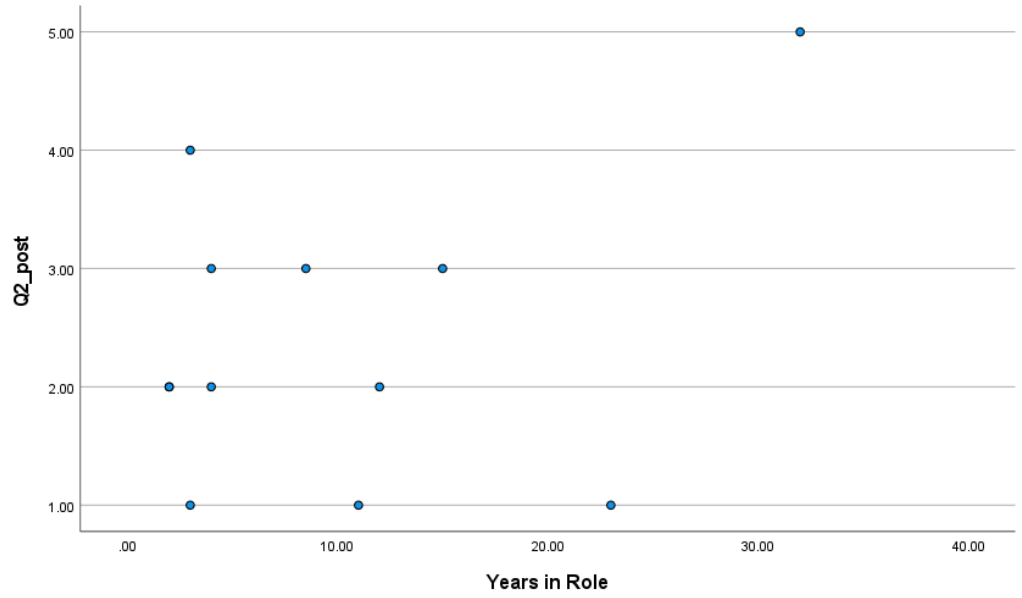

Figure 14. Question 2 Post-Survey

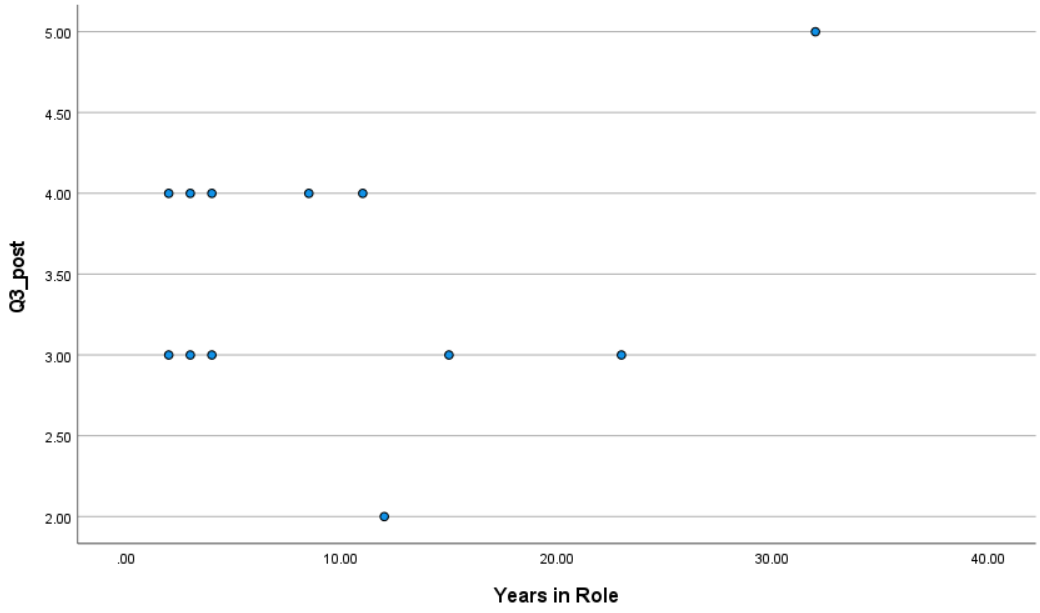

Figure 15. Question 3 Post-Survey

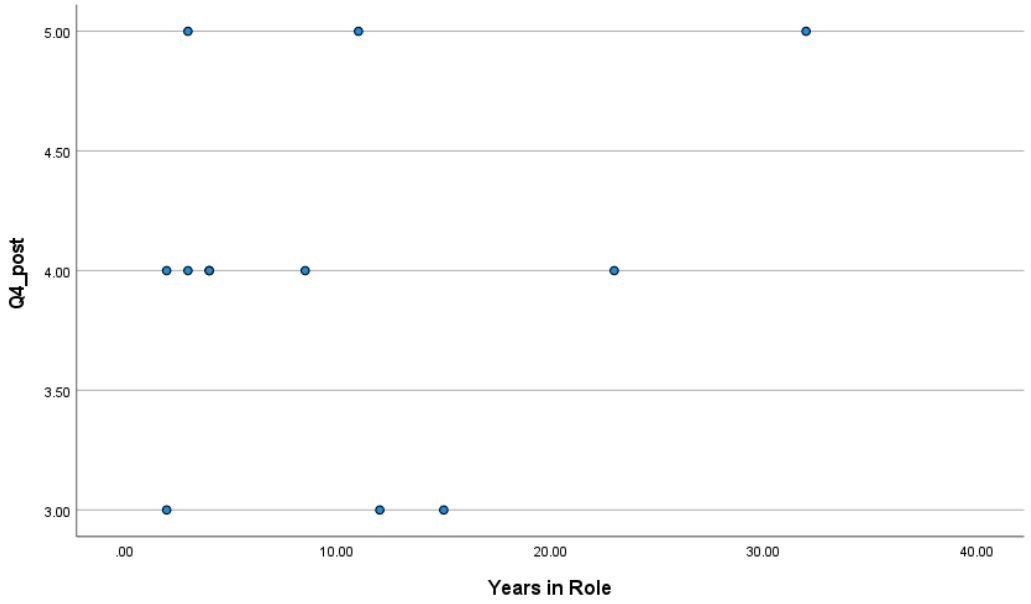

Figure 16. Question 4 Post-Survey

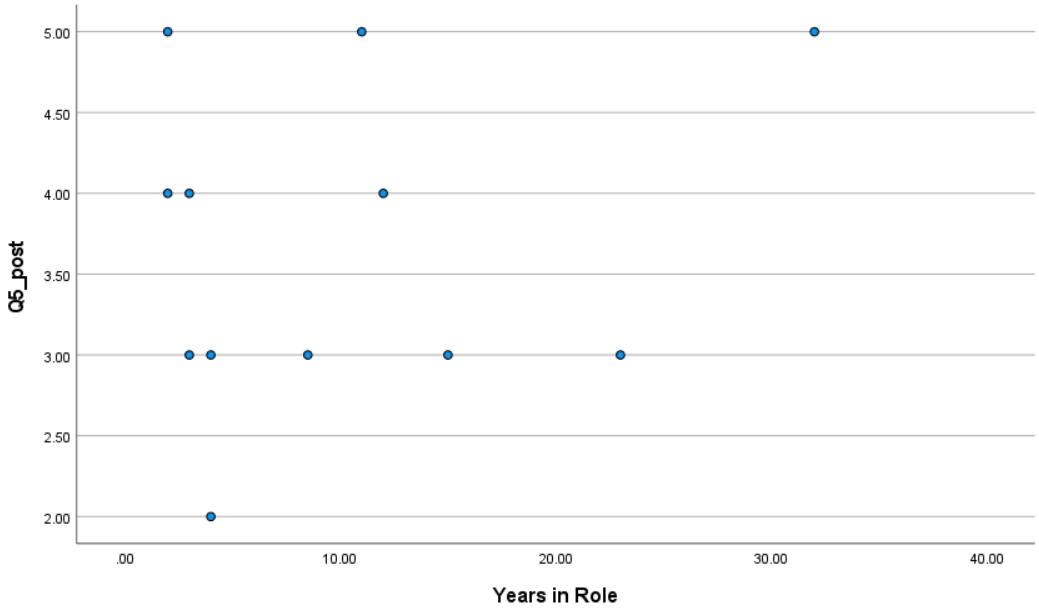

Figure 17. Question 5 Post-Survey

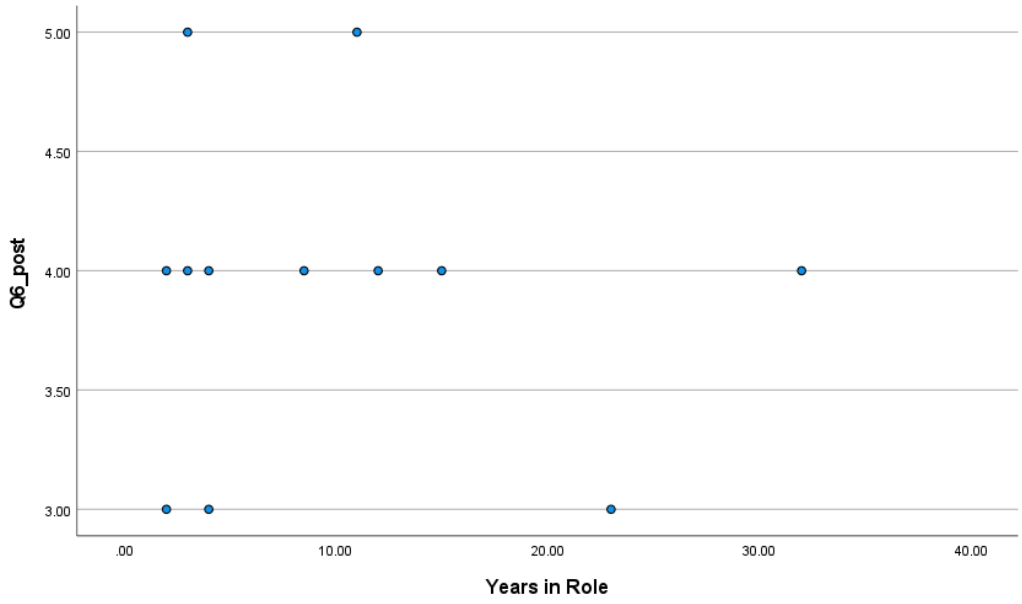

Figure 18. Question 6 Post-Survey

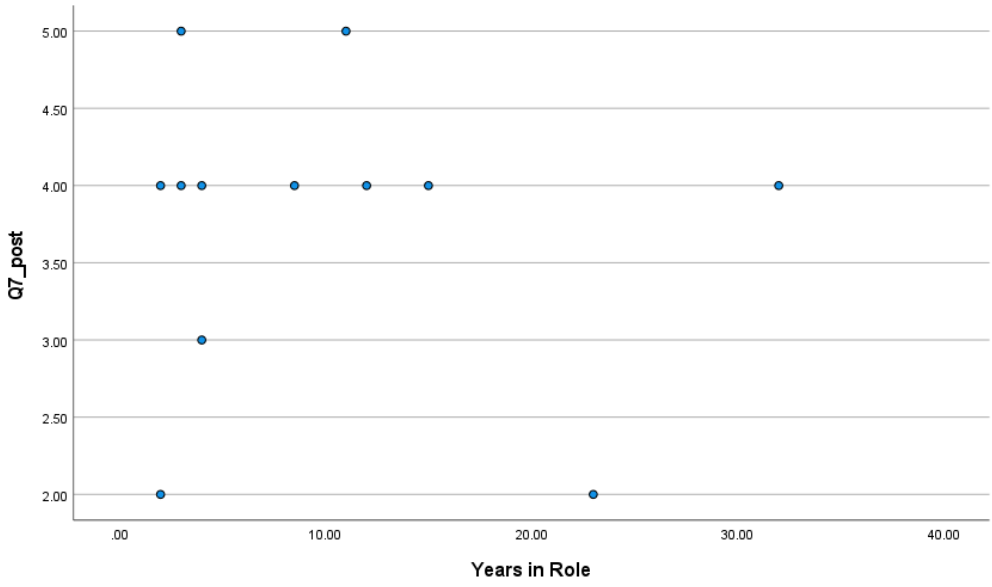

Figure 19. Question 7 Post-Survey

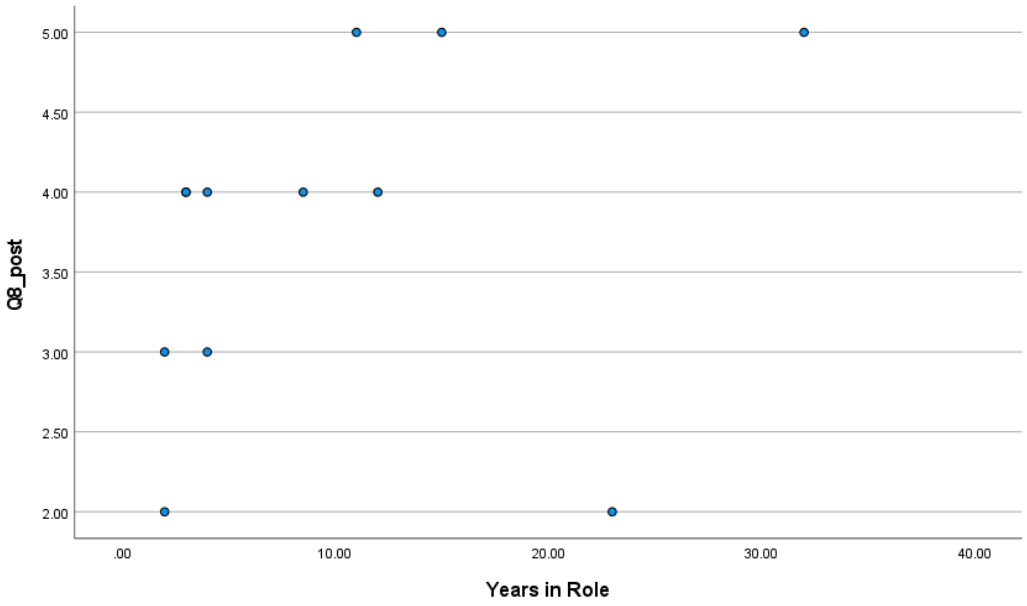

Figure 20. Question 8 Post-Survey

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