**EXAMINING THE IMPACT OF TRAINING IN DEAFBLINDNESS ON TEACHERS AND SPECIAL NEEDS ASSISTANTS KNOWLEDGE AND CONFIDENCE LEVELS**

**Authors:**

Karen Coleman

Grace Kelly-Hartnett

Deirdre Leech

Catherine McDonald

A close up of a device

Description generated with high confidence

**This research study was funded by the Teaching Council of Ireland: John Coolahan Research Support Framework**

**September 2018**

**ETHICS DECLARATION BY THE AUTHORS**

It is our promise that, while carrying out this research, we will observe the highest possible ethical standards. We will maintain the highest integrity at all times regarding data gathering.

We will avoid plagiarism and fully acknowledge the work of others to which we have referred in our study. We will report our findings honestly and truthfully. We consider the research project worthwhile and of benefit to the people we support. Strict confidentiality will be adhered to and at no time will names of participants, individuals or schools feature in our written report. Whilst acknowledging the rights of all the study participants, we also retain the right to report, provided that we have complied with all ethical protocols outlined here.

At no time will we involve children (anyone under the age of 18) as collaborators in our research study. Improving the supports and services in place for children who are deafblind is paramount to this study however only those who teach children will be asked to participate in the study.

Signed:

Karen Coleman: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Grace Kelly-Hartnett: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Deirdre Leech: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Catherine McDonald: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# **ABSTRACT**

**Examining the impact of training in deafblindness on teachers and special needs assistants’ knowledge and confidence levels**

This study investigates the impact of a short training course on classroom teachers and special needs assistants (SNAs) knowledge of deafblindness and levels of self-confidence when working with children who are deafblind.

International research in the field of deafblindness highlights the important role of teachers and others in the education of children who are deafblind and the need for personnel working with children in the classroom to understand the specific supports required by children who are deafblind. The findings of this study indicate that initial knowledge of deafblindness among teachers and SNAs was low. Before and after the training sessions, teachers and SNAs answered questionnaires that measured their knowledge of deafblindness and confidence levels in supporting children who were deafblind in the classroom. Training was shown to significantly improve participants knowledge and confidence levels immediately after training. At a one-month follow-up, 79% of the participants contacted had implemented at least one taught strategy suggesting that even short intensive training sessions can directly impact on the practice of teachers and classroom support staff.

# **ACKNOWLEDGEMENTS**

We, the authors, offer our sincere thanks and gratitude to the Teaching Council of Ireland for their generous funding towards this research study and for their ongoing support throughout the past year.

This research study would not have been possible without the participation of all the schools, principals, teachers and SNAs involved. Many thanks to each and every one of you.

We would like to extend our thanks to our colleagues and Board members in the Anne Sullivan Centre and Anne Sullivan Foundation, whose support and advice are very much appreciated.

**Contents**

[ABSTRACT 3](#_Toc524202341)

[ACKNOWLEDGEMENTS 4](#_Toc524202342)

[CHAPTER ONE 7](#_Toc524202343)

[INTRODUCTION AND RATIONALE 7](#_Toc524202344)

[1.1. Introduction 7](#_Toc524202345)

[1.2. Rationale 8](#_Toc524202346)

[1.3. Research objectives 8](#_Toc524202347)

[CHAPTER TWO 9](#_Toc524202348)

[LITERATURE REVIEW 9](#_Toc524202349)

[2.1. Understanding deafblindness 9](#_Toc524202350)

[2.2. Causes of deafblindness 10](#_Toc524202351)

[2.3. Supporting children who are deafblind in the Irish education system 10](#_Toc524202352)

[2.4. The specific supports required by children who are deafblind 12](#_Toc524202353)

[2.5. The structure and role of current services 13](#_Toc524202354)

[CHAPTER THREE 13](#_Toc524202355)

[METHODOLOGY 13](#_Toc524202356)

[3.1. Population and Sampling 14](#_Toc524202357)

[3.2. Data collection methods 14](#_Toc524202358)

[3.3. Research instrument 15](#_Toc524202359)

[3.4. Data analysis 16](#_Toc524202360)

[CHAPTER FOUR 17](#_Toc524202361)

[FINDINGS 17](#_Toc524202362)

[4.1. Demographic information 17](#_Toc524202363)

[4.2. Descriptive Statistics 18](#_Toc524202364)

[4.3. The impact of ASC training intervention on participant’s knowledge of deafblindness 19](#_Toc524202365)

[4.4. The impact of ASC training intervention on participants confidence levels 20](#_Toc524202366)

[4.5. The impact of the ASC training intervention on teachers’ ability to support children with disabilities other than deafblindness 21](#_Toc524202367)

[4.6. Other findings from questionnaires 21](#_Toc524202368)

[4.7. Results of follow-up phone interview with participants 21](#_Toc524202369)

[CHAPTER FIVE 23](#_Toc524202370)

[DISCUSSION 23](#_Toc524202371)

[5.1. The short and long-term outcomes of training 23](#_Toc524202372)

[5.2. Addressing the issue of terminology 24](#_Toc524202373)

[5.3. Experience no substitute for effective training 24](#_Toc524202374)

[5.4. The need for further research and data collection on the condition of deafblindess 24](#_Toc524202375)

[5.5. The importance of a collaborative approach 25](#_Toc524202376)

[CHAPTER SIX 26](#_Toc524202377)

[CONCLUSION AND RECOMMENDATIONS 26](#_Toc524202378)

[6.1. Conclusion 26](#_Toc524202379)

[6.2. Recommendations 27](#_Toc524202380)

[6.3. Limitations 29](#_Toc524202381)

[REFERENCES 30](#_Toc524202382)

[APPENDIX 1 36](#_Toc524202383)

[*MCQ* 36](#_Toc524202384)

[APPENDIX 2 38](#_Toc524202385)

[*PRE AND POST TRAINING QUESTIONNAIRE 38*](#_Toc524202386)

[APPENDIX 3 43](#_Toc524202387)

[*JASP RESULTS* 43](#_Toc524202388)

# 

# **CHAPTER ONE**

# **INTRODUCTION AND RATIONALE**

## **1.1. Introduction**

This study explores teachers and SNAs knowledge of and levels of confidence in supporting children who are deafblind in the classroom both before and after participating in a specifically designed training programme. This training programme was facilitated by a not for profit organisation that supports individuals who are deafblind in Ireland.

Teachers and SNAs are required to participate in professional training and gain relevant qualifications designed to help them carry out their responsibilities and support children in the classroom; their professional training has a limited scope and duration and it is likely that a lot of their learning and professional development occurs in the years after their professional training and during their work. Information on the condition of deafblindness is not routinely provided in teacher and SNA training programmes in Ireland.

Children with a disability in Ireland may be in mainstream school, a special class in a mainstream school or in a special school. The Department of Education and Skills (DES) policy is to integrate children as much as possible into mainstream school. The DES aims to dedicate special schools to a particular disability group and operate at a specially reduced teacher pupil ratio. In mainstream school, a child with a disability may have access to additional education support from a special education teacher and additional care supports from an SNA; Ireland does not provide children who are deafblind with access to a ‘deafblind intervenor’ in mainstream or special schools. A deafblind intervenor is described as a person who has specialized training in deafblindness and works one-to-one with an infant, child or youth who is deafblind, forming part of their educational team (National Consortium on Deafblindness, 2012). The concept of intervener services for individuals who are deafblind developed in Canada in the 1970’s (McInnes, 1999. p.75). As the Irish education system does not currently provide specialist deafblind intervenors, it is imperative that teachers and SNAs are knowledgeable about the condition of deafblindness and confident in implementing strategies to support a child or children who are deafblind.

## **1.2. Rationale**

Supports and services offered to children in schools are generally provided directly by teachers, SNAs and learning/resource teachers depending on need. Identification of specific support needs is vital to ensure that children have the resources to learn and interact with the world and people around them. Deafblindness is a condition that is recognised internationally as different to deafness or blindness requiring teachers, SNAs and others who work with children who are deafblind to be knowledgeable about the condition and the evidence-based strategies that are effective in supporting children to learn and interact. Lack of knowledge and low confidence levels among teachers or SNAs when supporting a child who is deafblind is therefore likely to have an adverse effect on the child.

Empirical studies indicate that short training sessions can increase teacher and SNAs knowledge of specific disabilities. The authors were not aware of previous studies examining the impact of training in deafblindness on teachers and SNAs knowledge and self-confidence and hoped that this study would be the first to demonstrate the positive impact of providing training in deafblindness, thereby indicating the benefits of increasing and improving the training available to teachers and SNAs.

## **1.3. Research objectives**

The aim of this study is threefold: firstly, it seeks to support teachers and SNAs ongoing professional development; secondly it aims to support children who are deafblind in a school setting and thirdly it aims to highlight the impact of the collaborative processes involved.

# **CHAPTER TWO**

# **LITERATURE REVIEW**

## **2.1. Understanding deafblindness**

‘Deafblindness’ has been used as an umbrella term to describe individuals who are affected with any level of combined hearing and vision loss (Ask Larsen & Damen, 2014; Wittich, Southall, Sikora, Watanabe & Gagne, 2013). The definition of deafblindness is far more complex than the loss of both vision and hearing; most individuals who are deafblind in fact have and make use of at least some residual vision and/or hearing (Schalock, 2015; R. van Dijk, Nelson, Postma, & J. van Dijk, 2010). Hearing and vision are known as the two major distance senses because they provide us with most of the information we receive beyond what we can touch or reach.

The European Parliament declared in 2004 that "deafblindness is a distinct disability that is a combination of both sight and hearing impairments, which results in difficulties having access to information, communication, and mobility. Definitions vary from country to country however the Irish government has not recognised deafblindness as a separate condition or agreed a formal definition of deafblindess, resulting in not for profit organisations adopting their own terminology and definitions.

According to a special cross tabulation performed by the Central Statistics Office (CSO) on the 2016 census results, there are 1,913 individuals who are deafblind in Ireland (a 9% increase since the 2011 census) and 11,722 individuals who are deafblind with at least one additional disability (a 13% increase since the 2011 census). Further data analysis shows that children who are deafblind with no additional disabilities now make up 3.6% of the population of people who are deafblind while children who are deafblind with at least one additional disability make up 23% of the population of people who are deafblind in Ireland. Those with deafblindness were identified by the CSO as the individuals who ticked the box on the census form to indicate deafness or serious hearing loss as well as the box to indicate blindness or serious vision loss.

Children and young people with sensory needs have been described as a “heterogenous group within which there is a wide spectrum of need and ability and includes children who are deaf or who have a hearing impairment, children who are blind or who have a visual impairment or a combination of both (McLinden and Douglas 2013 in McLinden and McCracken, 2016, p. 472). Although deafblindness is experienced differently from person to person, some frequently reported effects include difficulty in finding out information, difficulty in communicating and difficulty in moving around (Aitken, Buultjens, Clarke, Eyre & Pease, 2002).

## **2.2. Causes of deafblindness**

The condition of deafblindness is categorised into congenital deafblindness (from birth) and acquired deafblindness (late onset). Historically, the most common infectious cause was the Congenital Rubella virus, commonly known as the German measles. Due to immunisation programmes introduced in 1969, the number of new cases of rubella has significantly declined and congenital deafblindness is more likely to arise as a result of other conditions such as cytomegalovirus (CMV), toxoplasmosis or CHARGE syndrome (Aitken et al, 2002). Prematurity, birth trauma and foetal alcohol syndrome are also known causes of deafblindness. Acquired deafblindness on the other hand can be caused by a number of genetically inherited syndromes such as Usher syndrome, accidents or trauma and ageing. Ageing is the most common cause of deafblindness across the world.

## **2.3. Supporting children who are deafblind in the Irish education system**

Children who are deafblind have unique needs for learning, communication and environmental access. The implications of being deafblind will differ from individual to individual, according to factors such as additional intellectual disabilities, the level of residual vision and hearing, additional medical complications and previous learning experiences.International studies by Musyoka, Gentry and Meek (2017), Guardino (2015) and Musyoka et al (2016) found that few teachers are competent to teach children who are deaf with additional disabilities and that most teachers are not trained in the area of deafblindness.Parker and Nelson (2016) point out that both teachers and intervenors have an important part to play in supporting children who are deafblind in a classroom setting but because deafblindness is not recognised in many countries and there is usually a low incidence of deafblindness in schools,it is a challenge to develop systems that provide these children with highly qualified personnel with advanced training and knowledge in educational strategies for children and young people who are deafblind.

Classroom teachers, special needs assistants and resource teachers do not receive specific training in deafblindness as part of their basic training. Researchers in the field of deafblindess have pointed out that children are often supported with their intellectual or physical disability with the condition of deafblindness going unrecognised and unsupported. This then acts as a barrier to children accessing highly qualified deafblind specialists (National Consortium on Deafblindness, 2012).

Since 2017, the new Special Education Teaching allocation in Ireland has meant that special education resources are allocated to schools based on the school’s educational profile rather than to individual children. It is the responsibility of the school to deploy the resources based on the learning needs of the children it supports. There are many positives to this new model including the ability of schools to plan, greater certainty for schools as to the resources available to them and greater autonomy for schools in managing the provision of resources. Despite these improvements children who are deafblind may continue to face challenges if there are issues with identifying the condition of deafblindness in schools or with accessing specialist supports following identification.

While research into knowledge about deafblindness in the Irish education system is very limited, studies examining the knowledge that teacher’s hold about other disorders such as autism (Young, McNamara & Coughlin, 2013), deafness (Musyoka, Gentry and Meek, 2017) and ADHD (Kikas & Inge Timoštšuk (2015) indicate that teacher’s knowledge levels are low. In addition, confusion frequently exists with the use of the terms ‘deafblind’, ‘multisensory impairment’ and ‘dual sensory loss’.

Circular 08/99 (Department of Education and Skills, 1999) allocated specific resource teaching hours to schools to support individual pupils with special educational needs. Circulars 08/02 and 24/03 (Department of Education and Skills, 2002; 2003) allocated resource teaching to students with learning disabilities in mainstream schools in accordance with the level of support applicable for their category of disability. Evidently, this was not an ideal model for supporting children who are deafblind as deafblindness was not categorised as a separate disability. The changes to the system have created the potential for the learning needs of all children to be supported; it is now crucial that the needs of children who are deafblind are understood by teaching personnel and the Irish education system provides opportunities for individuals to gain specific training and qualifications in the area of deafblindness.

## **2.4. The specific supports required by children who are deafblind**

Despite deafblindness being recognized internationally as a heterogenous condition, Murdoch et al (2009) identified the need for specific supports for children and youths who are deafblind such as the recognition of sensory needs, communication, routine, ownership of learning and orientation and mobility. Hartmann & Weismer (2016) highlight the importance of integrating technology into children’s learning environment and identify that little guidance is available on the specific technology that is available to support children who are deafblind. Ferrell et al (2014) propose that technology use with this particular group should focus on multiple communication modes, opportunities for self-regulation, meaningful activities and anticipatory and calming strategies.

Researchers such as Nelson, Greenfield, Hyte and Shaffer (2013) have highlighted the existence of evidence-based practices that have been found to increase the active engagement of children who are deafblind as well as reduce behaviours that have been viewed as challenging. Of specific importance to children who are deafblind is the need to provide meaningful and interactive activities (Janssen, Ricksenwalraven & Van Dijk (2002) tactile or visual calendar systems (Roland & Schweigert, 2000) and calming strategies with a sensory focus (Sterkenburg, Schuengel & Janssen, 2008). Chen and Downing (2006) advocate the usefulness of a clear beginning, middle and end when carrying out activities with students who are visually impaired with intellectual disabilities. Cook, Richardson-Gibb and Nielsen (2016) comment on the usefulness of turn-taking and providing choice for children with a variety of disabilities.

A recent study by Brock et al (2017) found that the *how* educators are trained is a more important consideration than the length of time they spend in training. There is evidence to suggest that short training courses can improve both teacher knowledge and practice (Williams et al, 2009). Researchers such as Cook & Cook (2013) have pointed out that educational practices supported by scientific evidence should be used to improve learning outcomes for pupils with disabilities and effective training for teaching staff is required to ensure that this happens.

Yang and Rusli (2012) highlight the need to bridge the gap between research and practice by examining the extent to which practitioner’s regard strategies supported by research as valuable and relevant in their classroom practice.

## **2.5. The structure and role of current services**

The National Council for Special Education (NCSE) is an independent statutory body, established in 2003 as part of the EPSEN Act. Its remit is to improve the delivery of educational services for children with special educational needs. The NCSE provides support to schools, advice to educators, parents and guardians, undertake and disseminate research into special education and provide policy advice to the Minister for Education and Skills on special education matters. In 2015, the NCSE Project Iris (National Council for Special Education, 2015) which was a longitudinal study of the experiences of and outcomes for pupils with special educational needs in Irish schools found that while Irish schools were generally providing an inclusive learning environment for children with special needs and there was significant positive progress achieved by students, there were shortcomings in the system including the need for greater levels of teacher knowledge and expertise. A review of recent NCSE and HSE studies did not find any recent studies indicating an improvement in this situation.

The NCSE providesvisiting teachers for the blind or visually impaired and deaf or hard of hearing; visiting teachers provide longitudinal support to children, their families and schools from the time of referral through to post-primary education. Special Education Needs Officers (SENOs) within the NCSE interact with visiting teachers, parents and schools and liaise with the Health Services Executive (HSE) in providing resources to support children with special educational needs in schools. In their review of the role and structure of the Visiting Teacher service in Ireland, McCracken and McLinden (2014), recommended the retention of a dedicated specialist sensory support service for children with hearing and vision loss in Ireland, recognising the important role that they played in the lives of children. They made several other recommendations including the need for restructuring and continuing professional development (CPD) for visiting teachers. Restructuring has taken place within the NCSE and CPD is available for visiting teachers however it is unclear how much information visiting teachers are provided with on the condition of deafblindness as part of their CPD programme.

# **CHAPTER THREE**

# **METHODOLOGY**

## **3.1. Population and Sampling**

The Central Statistics Office (CSO) has produced data indicating that there are sixty-eight young people, under the age of eighteen with deafblindness (and no additional disabilities) in Ireland. CSO figures also indicate that there are four hundred and forty-six children under the age of 18 who are deafblind with at least one other disability. There are currently twenty-five children of school going age (6-18 years) receiving direct services from the ASC Outreach Services. These children are in both mainstream and special schools in 11 different counties around Ireland. Table 1 below provides a breakdown of the numbers of children receiving services per county.

|  |  |
| --- | --- |
| Kerry | 2 |
| Dublin | 4 |
| Galway | 5 |
| Cork | 4 |
| Clare | 1 |
| Mayo | 3 |
| Kildare | 2 |
| Tipperary | 1 |
| Louth | 1 |
| Longford | 1 |
| Wexford | 1 |

Table 1: Number of children receiving ASC deafblind specialist services per county

The ASC Outreach team has established strong links with teaching personnel and SNAs in the schools known to be supporting a child or children who are deafblind. All twenty-five schools that the ASC Outreach team are working with were invited to participate in this research study with the aim of securing at least one teacher from each school to attend a training session.

Eight schools agreed to take part providing fifty-two participants in total. Forty-seven participants completed both pre and post questionnaires. 38% of those were teachers and 60% were Special Needs Assistants. All training sessions were conducted by deafblind specialist consultans employed by the Anne Sullivan Centre.

## **3.2. Data collection methods**

After ethical agreements were reached between the authors, the principals of twenty-five schools known to support at least one child who is deafblind were invited to participate in training and research. An email invitation provided details about the research study and the free training offered by the Anne Sullivan Centre.

Questionnaires were collected and distributed at the beginning and end of every training session. In addition, willing participants (who signed their agreement on the questionnaire) were contacted by phone six weeks after the training to answer a small number of open-ended questions; this helped the researchers determine if taught strategies were implemented.

*Organisation of training events*

Four separate training sessions were facilitated by the Anne Sullivan Centre either during school hours or after-school hours.Training was provided face-to-face either in schools or in local Education Centres in Galway, Mayo, Dublin and Waterford. Training was presented through power point presentation, based on a programme that was authorised by the Anne Sullivan Centre. The participants received a copy of the presentation after the training which also included resources that they could further use in their practice.

*Content of training intervention*

The content of the power-point presentation focused on an overview of deafblindness, causes, implications, assessments and methods of alternative and augmentative communication. The intervention provided participants with insights into eight specific strategies that have been found to be of benefit when implemented with children who are deafblind: tracing; turn-taking; visual calendars; name identifiers; intensive interaction; clear beginning, middle, end; choice and labelling.

## **3.3. Research instrument**

*Questionnaires*

The study employed a pre and post training questionnaire and a scoring system that were adapted from previous research where reliability and validity had been established. Each pre and post questionnaire had a multiple-choice questionnaire (MCQ) attached which was developed by the Anne Sullivan Centre and used to provide further evidence of immediate knowledge gained from training. The MCQ can be viewed in Appendix 1 and the pre and post questionnaire can be viewed in Appendix 2.

Questions 1 to 4 on the pre-training questionnaire obtained demographic information on participants including age, gender, experience working with a child who is deafblind, role and type of school (special school or mainstream). It also measured the extent to which participants felt their training to date had prepared them to work with children who are deafblind and if there were any other terms which they used in place of the word deafblind, but which meant the same.

Participants perceived knowledge of deafblindness was measured on both the pre and post questionnaires using a three item four-point Likert scale which asked participants to rate how knowledgeable they felt about the condition, how long a list they could write about what they knew about deafblindness and how informed they were about strategies to support children who were deafblind. A similar measure was used by Anderson, Watt and Noble (2012) who found that there was good to excellent agreement between raters, as shown by inter-rater values of .78 to .90. The Cronbachs Alpha for the adapted scale used in this study was .682 (sd= 3.582. Cronbachs Alpha is a measure to assess the reliability of an instrument and .70 is generally the lowest acceptable score for reliability however the Cronbachs Alpha score may be affected when there are a small number of items in the scale (fewer than twelve) (Trizamo-Hermosilla and Alvarado, 2016) or where the sample size is less than 250 (Tang and Cui, 2012).

Participant’s levels of confidence working with children who are deafblind was also measured on the pre and post training surveys using an eight item five-point Likert scale. This measure was adopted from Austin, Kakacek & Carr (2010) and minimal edits were made to ensure it was suitable for this study. The survey was developed by the Boston Healthcare Associates in conjunction with the Epilepsy Foundation and was validated by the US Centres for Disease Control and Prevention (CDC). The Cronbachs Alpha for this scale was .803 (sd=.307) indicating a high level of reliability.

## **3.4. Data analysis**

Data analysis was carried out in two stages. The first set of analysis used data from the participants who filled in the pre-training questionnaires. Participant demographic characteristics were examined first. Next, correlation and regression analysis were used to evaluate variables associated with teachers and SNAs knowledge and self-confidence, using data from pre-training questionnaires. The second set of analyses used paired-samples *t* tests to examine differences in knowledge and self-efficacy scores between pre and post questionnaires. Data from the 47 participants who provided information for both pre and post questionnaire were used in these analyses.

# **CHAPTER FOUR**

# **FINDINGS**

## **4.1. Demographic information**

Forty-seven questionnaires were completed and analysed using software called JASP .8.6.0. The respondent characteristics can be viewed in Table 2 below. The complete analysis can be viewed in Appendix Three.

|  |  |
| --- | --- |
|  | **Respondent Characteristics** |
| **Gender**  Female  Male  Unknown | 91%  6%  3% |
| **Age**  18-25  26-34  35-44  45-54  55-64 | 1%  19%  40%  23%  17% |
| **Specific role**  Teacher  SNA | 38%  62% |
| **Type of school**  Mainstream school  Special school | 6%  94% |
| **Years of professional experience working with a child who is deafblind**  0-1  2-3  4-5  6-8  10+ | 32%  26%  21%  4%  17% |

Table 2: Survey respondent characteristics

In total, 47 participants completed the questionnaire. There was a significant gender difference with 91% of participants recorded as female and 6% recorded as male. The results are not entirely surprising and are in line with gender distribution in the health and social care sector (Central Statistics Office, 2014). With respect to age, the largest grouping was the 35-44 age bracket which made up 40% of the total respondents. The second largest age bracket were those aged 45-54 with a 23% share. There was one participant under the age of 25.

The largest response came from teachers and SNAs working in special schools with a 94% share. Those working in mainstream schools accounted for only 6% of the responses. 62% of the participants were SNAs and 38% were teachers.

## **4.2. Descriptive Statistics**

Table 3 below presents the means, standard deviations and zero-order construct correlation coefficient estimates for the variables. Data from the pre-questionnaires was used in this analysis. Examination of the correlation matrix showed a significant interaction between a) participant knowledge and participant confidence levels b) previous training and knowledge and c) previous training and confidence levels. Significant interaction is determined in statistical analyses by the p-value which is a number between 0 and 1; a small p-value (typically ≤ 0.05) indicates significant interaction between variables.

Variables such as age, gender, years’ experience working with a child or children who are deafblind, the type of school or role did not appear to have any statistically significant impact on teachers and SNAs knowledge of deafblindness or their confidence when working with a child who is deafblind. These results are discussed in chapter five.

| **Pearson Correlations** | | | | | | | | | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | |  | | **knowl** | | **conf** | | **Age** | | **Gender** | | **Yrs exp** | | **Type of school** | | **Role** | | **Prev training** | |
| knowledge |  | Pearson's r |  | — |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| p-value |  | — |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| confidence |  | Pearson's r |  | 0.585 |  | — |  |  |  |  |  |  |  |  |  |  |  |  |  |
| p-value |  | **< .001** |  | — |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Age |  | Pearson's r |  | 0.053 |  | 0.164 |  | — |  |  |  |  |  |  |  |  |  |  |  |
| p-value |  | 0.722 |  | 0.272 |  | — |  |  |  |  |  |  |  |  |  |  |  |
| Gender |  | Pearson's r |  | 0.163 |  | 0.226 |  | -0.033 |  | — |  |  |  |  |  |  |  |  |  |
| p-value |  | 0.275 |  | 0.127 |  | 0.825 |  | — |  |  |  |  |  |  |  |  |  |
| Yrs exp |  | Pearson's r |  | 0.008 |  | 0.057 |  | 0.362 |  | 0.029 |  | — |  |  |  |  |  |  |  |
| p-value |  | 0.956 |  | 0.704 |  | 0.012 |  | 0.844 |  | — |  |  |  |  |  |  |  |
| Type of school |  | Pearson's r |  | -0.210 |  | -0.147 |  | 0.033 |  | 0.068 |  | -0.227 |  | — |  |  |  |  |  |
| p-value |  | 0.157 |  | 0.325 |  | 0.825 |  | 0.649 |  | 0.125 |  | — |  |  |  |  |  |
| Role |  | Pearson's r |  | -0.059 |  | -0.133 |  | -0.079 |  | 0.347 |  | -0.116 |  | 0.197 |  | — |  |  |  |
| p-value |  | 0.692 |  | 0.371 |  | 0.598 |  | 0.017 |  | 0.436 |  | 0.185 |  | — |  |  |  |
| Prev training |  | Pearson's r |  | 0.691 |  | 0.502 |  | 0.134 |  | 0.052 |  | 0.065 |  | -0.308 |  | -0.263 |  | — |  |
| p-value |  | **< .001** |  | **< .001** |  | 0.369 |  | 0.730 |  | 0.666 |  | 0.035 |  | 0.074 |  | — |  |
|  | | | | | | | | | | | | | | | | | | | |

Table 3: Pearson Correlation

## **4.3. The impact of ASC training intervention on participant’s knowledge of deafblindness**

The impact of the training intervention on participants knowledge of deafblindness was examined in three ways:

* By comparing the mean rating of participants on the pre and post training questionnaires of the effectiveness of their training to date.
* By comparing participants’ mean scores on multiple- choice questions in pre and post training questionnaires
* By carrying out a paired sample test analysis using JASP to compare participant’s perceived knowledge about deafblindness on the pre and post training questionnaire.

From the pre-training questionnaire, it was established that the mean rating by teachers of the extent to which they felt that their basic teacher training had prepared them for working with children who are deafblind was 2.51, indicating that they felt somewhere between ‘very little’ and ‘somewhat’ prepared. Following training, the same question was asked to participants in the post-training questionnaire which showed a mean rating of 3.48, indicating that participants felt somewhere between ‘somewhat’ and ‘prepared to a great extent’.

Results from the pre and post training MCQ’s found that the average participant score on the pre-test was 60% and the average participant score of the post-test was 90%. The mean score for knowledge levels on the pre-questionnaire was 2.4 while the mean score for knowledge on the post-questionnaire was 3.3. These results demonstrate the positive short-term impact of the training session on participant’s knowledge of deafblindness.

Paired sample t-tests were used to compare results from the pre and post questionnaires. Scores relating to the scale used to measure knowledge on the post questionnaire were significantly higher (M=3.348, SD=.423) compared to scores from the pre-questionnaire (M=2.383, SD=.628). The margin of error was very low at 1% and the robustness check indicated that the results were strong.

Examination of the correlation scores using the pre-questionnaire data found that participants role (whether they were a teacher or SNA) was not a significant predictor of knowledge about deafblindness. Analysis of the same hypothesis using post-questionnaire analysis showed that role was a predictor of knowledge immediately following training. As there was a sizeable disparity between the numbers of participants from mainstream schools (6%) and special schools (94%), it is difficult to ascertain if there was a difference between the knowledge and confidence levels of teachers and SNAs in different types of schools. There was a significant correlation between previous training and knowledge as well as previous training and confidence levels. Participants were asked about the sources of previous training; participant comments included training or information on deafblindness from the Anne Sullivan Centre Deafblind Specialist Consultant, a recent seminar by the late Dr. Jan Van Dyke, a workshop on supporting children’s communication, lamh training and PECS training.

## **4.4. The impact of ASC training intervention on participants confidence levels**

Paired sample t-tests were used to compare results from the pre and post questionnaires. Scores relating to the scale used to measure confidence levels on the post questionnaire were significantly higher (M=4.120, SD=.380) compared to scores from the pre-questionnaire (M=3.011, SD=.694). Results show that, prior to participating in the ASC training intervention, teachers and SNAs had a moderate level of confidence in working with children with deafblindness while results from the post-training surveys indicated a significant improvement in confidence levels.

Participants were also asked if they frequently used any other term to mean the same as ‘deafblindness. 34% of participants provided an alternative term pre-training which indicates that terminology may be confusing to people; the alternative terms used were multisensory impairment, dual-sensory loss, hearing loss, visual loss and hearing and visual impairment. Lack of clarity regarding the terminology of the condition may affect teachers and SNAs levels of self-confidence when working with children who are deafblind.

## **4.5. The impact of the ASC training intervention on teachers’ ability to support children with disabilities other than deafblindness**

The final question on the post-training questionnaire asked participant to rate how useful the strategies they learned in the intervention would be in supporting children who have other types of disabilities. On the rating scale, 1 equalled ‘Not at all’ and 4 equalled ‘To a great extent’. The mean rating was 3.85, indicating that the value of the ASC training intervention far exceeded the initial aim which was to support children who are deafblind and their teaching/support staff.

## **4.6. Other findings from questionnaires**

Results from the post-training questionnaire found that on average, participants agreed/strongly agreed that the training intervention will be useful to them in their work and they agreed/strongly agreed that they would plan to use at least one of the taught strategies in their work over the next 4-6 weeks.

## **4.7. Results of follow-up phone interview with participants**

All forty-seven participants were asked in the post-training questionnaire if they would be happy to participate in a short phone interview after the training. Twenty-nine of the participants provided their details on the questionnaire and were contacted by phone or email approximately 6-8 weeks after the training however only fourteen people took part in the interview. Following a brief verbal recap on the strategies that were taught, participants were asked four closed questions:

1. How many of the 8 strategies were new to you? (Unheard of before the training)

3. How many of the strategies have you used/drawn up in your work since the training?

4. Of the strategies that you have used, how many of these were new to the child you were working with?

5. Would you say that the strategy you used had a positive impact on the child you support?

The results of the phone interview can be viewed in Table 4 below.

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  | **COMMENTS** |
| Q1 | The number of participants who stated that at least one strategy was new to them | 6/14 | ‘Tracing’ and ‘labelling’ were named as ‘new’ strategies to some participants. |
| Q2 | The number of participants who used/drew upon at least one of the strategies in their practice after the training | 11/14 | 3 participants introduced name identifiers  4 participants increased the choices available to their pupils  1 participant attempted tracing with a child  1 participant expanded a pupil’s visual communication system  2 participants worked on intensive interaction with their pupils |
| Q3 | The number of children who were introduced to a new strategy (never before tried) according to participants | 2/14 | Of the 11 participants who implemented at least one strategy, 9 commented that the strategy had been tried before in the past- to some degree. |
| Q4 | The number of participants who reported a positive impact after implementing a strategy | 11/11 |  |
|  | Open ended-comments |  | 1. “It’s great to learn new strategies...we are always looking for new ideas and often it is the same ones we hear repeated”  2. “The training was great…I have an autistic boy and a girl with low sight in my class and I am using some of the strategies with her...visual communication systems and name ID’s are working really well now”  3. I work with a lady who has very complex needs and a lot of the strategies have been tried with her but there is very little reaction from her…I think we need something different for that particular group of children…although intensive interaction works well with her and it is what we do most of” |

Table 4: Findings from follow-up phone interviews with participants

# **CHAPTER FIVE**

# **DISCUSSION**

## **5.1. The short and long-term outcomes of training**

Overall, results were positive showing that participants’ knowledge and confidence levels had improved significantly after training. According to mean ratings on the pre-training questionnaire, participants felt ‘very little’ to ‘somewhat prepared’ when tasked with supporting a child who is deafblind in the classroom. After the training, participants felt ‘somewhat prepared’ to ‘prepared to a great extent’ with mean scores showing that participants ‘strongly agreeing’ to use at least one of the taught strategies in the following weeks. In a short follow-up interview with one of the course facilitators, she commented on the energy in the room and the interaction between the participants when discussing the strategies. The findings from analyses of the questionnaires show the effectiveness of even a short training course and the need for teachers and SNAs to receive information on the topic of deafblindness, its causes, effects and effective evidence-based strategies.

79% of the participants interviewed in the weeks afterwards had implemented at least one of the taught strategies indicating transfer to practice from learning. Results indicate that the training intervention offered met participant’s need for information and led to them acquiring new knowledge which in many cases was found to help them when they met with children in the days and weeks after training. These results are consistent with previous research findings which show that short training sessions can improve basic knowledge about disability (McKenzie et al., 2000).

## **5.2. Addressing the issue of terminology**

Encouragingly, in the pre-training questionnaire, 66% of participants agreed or strongly agreed that they could recognise when a child was deafblind. This number jumped to 81% following the training intervention. The results indicate that almost 20% of people were not confident that they could recognise when a child was deafblind. Part of the reason for confusion may be related to the terminology; fifteen participants used alternative terms to describe deafblindness such as ‘multisensory loss’ or ‘dual sensory loss. In line with the recommendations made by Wittich et al (2013), the authors of this study highlight the need to clarify the terminology, specifically across professionals and interest groups specific to deafblindness so that research into deafblindness is accurate and professionals find it easier to access evidence-based research findings.

## **5.3. Experience no substitute for effective training**

Findings show that teachers and SNAs confidence levels in supporting a child who is deafblind is linked to their knowledge of the condition. Interestingly, the correlation analysis found that years of experience working with a child who is deafblind had no significant impact on teachers and SNAs knowledge of deafblindness or their confidence levels in working with a child who is deafblind. This may be explained by the lack of training specifically in deafblindness that had been offered to many participants previously as well as the type of questions asked on the pre and post questionnaires which focused on participant’s ability to identify deafblindness as a condition and the specific supports required by children who are deafblind rather than the individual child/children they may be working with presently. Previous training in deafblindness was significantly correlated to participant knowledge and confidence levels which highlights the need for training for all teachers and SNAs on an ongoing basis.

## **5.4. The need for further research and data collection on the condition of deafblindess**

In line with the findings of Musyoka, Gentry & Meek (2017), the results of this study indicate a need for further research on teacher and SNA competencies and preparedness to support children who are deafblind. There is a need for professionals in both roles to go beyond traditional teaching methods and the ‘one size fits all’ approach to ensure that the learning needs of all students are adhered to.

The Irish Census Form does not request individuals to identify as deafblind rather it calculates the prevalence of deafblindness by the number of individuals who have ticked the box to indicate serious hearing loss/deafness as well as the box to indicate serious vision loss/blindness. The identification of deafblindness in individuals is not a straightforward action as deafblindness is a highly diverse condition which is experienced differently from person to person (Miller & Hodges, 2005) however, international researchers and professionals in the field of deafblindness have repeatedly described how deafblindness is separate to deafness and blindness and promoted the need for individual countries to identify deafblindness as a separate condition so that individuals who are deafblind are provided with a care pathway that meets the full extent of their individual needs including communication, sensory and social needs.

## **5.5. The importance of a collaborative approach**

Previous research studies have shown that teaching staff have limited knowledge about other disorders considered under the umbrella term of ‘’disability’ or ‘special educational needs’ (Ghanizadeh et al., 2006; Sadler, 2005 in Rae et al (2011). A new Resource Allocation Model was introduced into Ireland by the Department of Education and Skills in 2017 which aimed to improve outcomes for children with special educational needs This model promises many benefits to children including the removal of waiting times for diagnosis of disability which was previously a barrier to children accessing resources. However, teachers and support staff still need to have a basic knowledge of disability, including deafblindness, so that they themselves can implement the day-to-day strategies that best suit the needs of individuals. In countries, such as the US and Canada it is possible for teachers and classroom support staff to attend designated, deafblindness-specific teacher preparation programmes, which provide participants with specific qualifications in deafblindness. As Ireland is comparatively smaller in size, the prevalence of deafblindness among children is likely to be lower than in those countries however this should not be a reason for ignoring the issue or lack of action. It is more important than ever in small countries such as Ireland that educational institutions, health and social care professionals and not-for-profit bodies work together to ensure that specialist information on deafblindness that is held by a small number of people is shared among the wider population.

Besides enhancing the levels of knowledge and confidence among participants, this study highlights the importance of collaboration between education and social care sectors. Organisations supporting individuals with disabilities hold a lot of specialised information and expertise about how best to support people and it is evident that this information is not widely shared. Schools can avail of the necessary information through establishing partnerships with disability organisations and requesting training as well as input from qualified and experienced personnel in the social care sector.

# **CHAPTER SIX**

# **CONCLUSION AND RECOMMENDATIONS**

## **6.1. Conclusion**

This study aimed to investigate the impact that a short training event had on teaching staff knowledge and confidence levels regarding deafblindness. A child who is deafblind requires specific supports to learn and interact with others requiring unique and creative teaching methods in pre-schools and schools. Those working with children in the classroom require training and information to understand the approaches that work well with children who are deafblind and to have the confidence to apply strategies effectively. The training intervention implemented as part of this research study achieved its aim to educate teachers and SNAs on the strategies and resources they can use to effectively support the learning and development of children who are deafblind.

Participant knowledge and confidence levels prior to the training intervention were low however the levels improved significantly after the training intervention. Results from the pre and post training MCQ’s found that the average participant score on the pre-test was 60% and the average participant score of the post-test was 90%. The mean scores for knowledge and confidence levels on the pre-questionnaire increased greatly; these results demonstrate the positive short-term impact of the training session on participant’s knowledge of deafblindness. The training intervention was found to have impacted on practice at 6-8-week follow-up indicating transfer of learning to practice. All participants who reported implementing at least one strategy stated that the implementation of the strategy had a positive effect on the child they were supporting.

Terminology differences were evident; this is a cause of concern as it may be a barrier to ensuring that children who are deafblind have the necessary supports.

As Ireland has very recently ratified the United Nations Convention on the Rights of People with Disabilities (UNCRPD), which identifies deafblindness as a condition separate to deafness and blindness, this study, it’s findings and recommendations are relevant and timely.

## **6.2. Recommendations**

1. It is clear from the results of this study that providing training and information on deafblindness has a positive impact on teachers and SNAs knowledge of deafblindness and their confidence levels in supporting a child who is deafblind in the classroom. The first recommendation is therefore to incorporate training in deafblindness into existing teacher training and SNA training programmes and include refresher training in continuing professional development programmes.

2. School principals would benefit greatly from training and information in deafblindness as the allocation of resources to children is largely the responsibility of principals and without their understanding of the condition and the specific supports required, there is a risk that resources will not be allocated to support this group of children with often unrecognised needs.

3. Future training should incorporate performance feedback for teachers and support staff whereby the individual implementing the strategy is observed by a specialist in deafblindness, data is collected and then shared with the teacher or support staff to improve future performance. Fallon, Collier-Meek, Maggin, Sanetti, and Johnson (2015) highlighted the benefits of performance feedback as an effective evidence-based practice. Brock and Carter (2013; 2017) identified the effectiveness of combining performance feedback with modelling and therefore the use of these two strategies in conjunction would further enhance the ability of teaching and support staff to support children who are deafblind.

4. The Irish government should familiarise itself with the Alice Cogswell and Anne Sullivan Macy Act, introduced in the U.S House of Representatives in 2015, which represents the combined efforts of low-incidence disability communities to address critical gaps in the US education system. This legislation proposes national state infrastructures to effectively support children who are deaf/hard of hearing, blind/low vision and deafblind. Section three of the act highlights the provisions for students who are deafblind, with an emphasis on the need for access to highly qualified specialists in the area of deafblindness and individualised supports. Children who are deafblind in schools across Ireland are currently without legal access to specialised ‘interveners’ who are required to support children to access the curriculum using the mode of communication of their choice. Individual schools, however, such as St Columba’s National School in Douglas, County Cork have instigated change through increasing the supports available to children who are deaf through providing an ‘educational interpreter’ in the classroom where required.

5. The roles of the visiting teachers and specialist consultants in the area of deafblindness must be clarified to avoid overlap and confusion. Government bodies such as the NCSE must understand the need for teachers and SNAs to be educated on the subject of deafblindness, recognise the expertise that exists nationally and introduce a clear system that allows for the transfer of knowledge from the experts to the classroom teachers and SNAs.

6. A formal system for deafblind education in Ireland is paramount. There must be acknowledgement of the need for deafblind interveners in the classroom where required and formal standards/guidelines on educating/supporting children who are deafblind in Ireland. When such recognition is in place, preservice and in-service professional development for both teachers and SNAs can flourish.

7. Because it is likely that time to engage in continuing professional development will continue to be a challenge, collaborative working and delivery will be necessary if the complex needs of this population are to be met. Such collaborations might include (a) alignment and sharing of courses on deafblindness with the fields of deafness, blindness, and other disabilities; (b) resource sharing with organisations charged with in-service training; (c) development of innovations in online learning.

8. An evaluation of educational provision for children who are deafblind should be undertaken by the NCSE, in a similar style to their 2016 publications on autism spectrum disorder. (National Council for Special Education, 2016).

## **6.3. Limitations**

Although this study makes valuable contributions to the literature on deafblindness and teacher education there are some limitations that are important to bear in mind when interpreting the findings. Firstly, the study is based on a small sample of forty-seven teachers and SNAs;while previous studies have been carried out with less participants, it would be useful to repeat this study or ideally carry out a longitudinal study with a larger sample size.

Secondly, the number of participants interviewed by phone in the weeks afterwards represented only 30% of the entire sample therefore the actual transfer from learning to practice may be higher or lower than reported. Thirdly, the measures used to assess participants knowledge and self-confidence levels may be challenged on the basis that they were modified from the original scales used in previous studies. The authors of this study agreed that adaptations were necessary to the original scales which were developed to measure knowledge of attention deficit hyperactivity and epilepsy. The authors could not locate any scales that were used in previous studies to measure participant knowledge of deafblindness and confidence levels when working with children who are deafblind.

The researchers had hoped to facilitate a two-day workshop with research participants however due to teachers and SNAs time constraints, this was not possible. It is important to highlight that some of the schools that participated in the training had already received information and training, in varying degrees, from the Anne Sullivan Centre deafblind specialist consultant. The pre-training questionnaire aimed to capture the level of information and training that participants had previously received however the majority of participants did not answer this question. This may be due to the fact that it was an open-ended question as most other questions were closed and were completed.

Despite the limitations outlined above, this study has many significant strengths. It is the first study to examine the impact of training in deafblindness on teacher and SNA knowledge and confidence levels, making an important contribution to the literature. The positive findings will hopefully prompt future opportunities for training in deafblindness for teachers and SNAs in all schools.

# **REFERENCES**

Aitken, S., Buultjens, M., Clark, C., Eyre, J.T., Pease, L. (2002). *Teaching Children who are Deafblind*. David Fulton Publishers: London.

Ask Larsen, F., Damen, S. (2014). *Definitions of Deafblindness and Congential Deafblindess*. Research in Developmental Disabilities. 35(10).

Austin, J., Kakacek, K., Carr, D (2013*). Impact of Training Program on School Nurses’ confidence levels in managing and supporting students with epilepsy and seizures*. The Journal of School Nursing. 26 (6), pp. 420-9

Brock, M. E., & Carter, E. W. (2013). *A systematic review of paraprofessional-delivered instruction to improve outcomes for students with intellectual and developmental disabilities*. Research and Practice for Persons with Severe Disabilities. 38 (4), pp. 211–221.

Brock, M., Carter, E (2017). *A Meta-Analysis of Educator Training to Improve Implementation of Interventions for Students with Disabilities.* Remedial and Special Education. 38(3), pp. 131-144)

Chen, D., Downing, J. (2006). *Tactile Strategies for Children who have Visual Impairments and Multiple Disabilities: Promoting Learning and Communication Skills*. AFB Press: American Foundation for the Blind.

Cook, B. G., & Cook, S. C. (2013). *Unravelling evidence-based practices in special education.* The Journal of Special Education, 47 (2), pp. 71–82

Cook, B., Richardson-Gibbs, A.M., Nielsen, L. (2016). *Strategies for Including Children with Special Needs in Early Childhood Settings*. England: Cengage Learning.

Ferrell, K. A., Bruce, S., & Luckner, J. L. (2014). *Evidence-based practices for students with sensory impairments* (Document No. IC-4). Retrieved from University of Florida, Collaboration for Effective Educator, Development, Accountability and Reform Centre website: http://ceedar.education.efl.edu/tools/innovation-configurations/

Ghanizadeh, A., Bahredar, M. & Moeini, S (2006). *Knowledge and Attitudes towards Attention Deficit Hyperactivity Disorder among Elementary School Teachers.* Patient Education and Counseling. 63 (1), pp. 84–8

Guardino, C. (2015). *Evaluating teachers' preparedness to work with students who are deaf and hard of hearing with disabilities*. American Annals of the Deaf. 160(4).

Hartmann, E., Weismer, P. (2016). *Technology integration and curriculum engagement for children and youth who are deafblind*. American Annals of the Deaf. 161(4), pp. 462-473

Janssen, M. J., Riksen-Walraven, J. M., Van Dijk, J. P M. (2002). *Enhancing the quality of interaction between deafblind children and their educators*. Journal of Developmental arid Physical Disabilities. 14(1), pp. 87-109.

Kikas, E., Timoštšuk I. (2015). *Student teachers’ knowledge about children with ADHD and depression and its relations to emotions, emotional and behavioural difficulties.* 21(2), pp.190-204

McCracken, W., McLinden, M (2014). *Review of role, organisation and management of visiting teachers for children with hearing and visual impairment (VTHVI) Ireland*. Final report.Available:<https://www.education.ie/en/Publications/Education-Reports/pub_ed_review_VTHVI_service_ireland.pdf>

Mclnnes, J. M. (1999). Deafblindness: a unique disability. In J. M. Mclnnes (Ed.), *A guide to planning and support for individuals who are deafblind.* Toronto: University of

planning and support for individuals who are deafblind (pp. 3-33). Toronto: University of

Toronto Press

McKenzie, K., Matheson, E., Patrick, S., Paxton, D. & Murray, G. C. (2000). *An Evaluation of the Impact of a One Day Training Course on the Knowledge of Health, Day Care and Social Care Staff Working in Learning Disability Services.* Journal of Learning Disabilities. 4 (2). Pp. 153–6.

McLinden, M., McCracken W. (2016). *Review of the visiting teachers service for children with hearing and visual impairment in supporting inclusive educational practice in Ireland: examining stakeholder feedback through an ecological systems theory*. European Journal of Special Needs Education. 31(4), pp. 472-488

Miller, O. & Hodges, L. (2005) ‘Deafblindness’, in A. Lewis & B. Norwich (eds) Special Teaching for Special Children? Pedagogies for inclusion. Maidenhead: Open University

Musyoka, M. M., Gentry, M. A., Bartlett, J. J. (2016). *Voices from the classroom: Experiences of teachers of deaf students with additional disabilities.* Journal of Education and Training Studies. 4(2), pp. 85-96

Musyoka, M. M., Gentry, A.M &Meek, D. **(**2017). Perceptions of teachers’ preparedness to

teach deaf and hard of hearing students with additional disabilities: A Qualitative case

study. Journal of Developmental and Physical Disabilities. 29(5).

National Consortium on Deaf-Blindness. (2012). *Recommendations for improving intervener services*. Retrieved from http://interveners.nationaldb.org.

National Council for Special Education (2016). *An Evaluation of Education Provision for Students with Autism Spectrum Disorder in Ireland.* Ireland: National Council for Special Education.

Nelson, C., Bruce S. (2016). *Critical Issues in the lives of Children and Youth who are Deafblind. American Annals of the Deaf.* 161(4), pp. 406-411

Nelson, C., Greenfield, R. G., Hyte, II. A., Shaffer, J. P (2013). *Stress, behaviour, and children and youth who are deafblind*. Research and Practice for Persons with Severe Disabilities. 38(3), pp.139-156.

Nelson, C., & Sanders, D. (2014). *Collaboration to ensure effective education of students who are deafblind*. Visual Impairment and Deafblind Education Quarterly. 59(5), pp.26-35

Parker, A., Nelson, C. (2016). *Towards a Comprehensive System of Personnel Development in Deafblind Education.* American Annals of the Deaf. 161 (4), pp 486-501

Rae, H., McKenzie, K., Murray, G. (2011). *The Impact of Training on Teacher Knowledge about Children with an Intellectual Disability*. Journal of Intellectual Disabilities. 15(1), pp. 21-30

Rose, R. (2001). *Primary School Teacher Perceptions of the Conditions Required to Include Pupils with Special Educational Needs*. Educational Review. 53(2), pp. 147–56

Rowland, C., Schweigert, E. (2000). *Tangible symbols, tangible outcomes*. Augmentative and Alternative Communication. 16, pp. 61-78.

Sadler, J. (2005). *Knowledge, Attitudes and Beliefs of the Mainstream Teachers of Children with a Preschool Diagnosis of Speech/Language Impairment*. Child Language Teaching and Therapy. 21 (2), pp. 147–63.

Schalock, M. (2015). *The 2014 National Child Count of Children and Youth Who Are DeafBlind.* Monmouth.

Smith, B. C., & Smith, J. (2013). *The building of transformational leadership for the field of sensory disabilities: The National Leadership Consortium in Sensory Disabilities*. DVI Quarterly: Division on Visual Impairments. 58(3), pp.35-45.

Sterkenburg, E, Schuengel, C., Janssen, C. (2008). *Developing a therapeutic relationship with a blind client with a severe intellectual disability and persistent challenging behavior*. Disability and Rehabilitation. 30, pp. 1318-1327.

Tang W., Cui Y. (2012). *A Simulation Study for Comparing Three Lower Bounds to Reliability.* Available online at: [http://www.crame.ualberta.ca/docs/April 2012/AERA paper\_2012.pdf](http://www.crame.ualberta.ca/docs/April2012/AERApaper_2012.pdf)

Trizano-Hermosilla I, Alvarado JM. (2016). *Best Alternatives to Cronbach’s Alpha Reliability in Realistic Conditions: Congeneric and Asymmetrical Measurements*. Frontiers in Psychology. 7:769.

Van Dijk, R., Nelson, C., Postma, A., Van Dijk, J. (2010). Deaf children with severe multiple disabilities: Etiologies, intervention, and assessment. In M. Marschark & P Spencer (Eds.), *Oxford handbook of deaf studies, language, and education* (Vol. 2, pp. 171-192). New York, NY Oxford University Press

Williams, T., McKenzie, K. & McKenzie, A. (2009). *Training Care Staff about the Concept of Learning Disability*. Learning Disability Practice. 12 (5), pp. 34–7

Witticch, W., Southall, K., Sikora, L., Watanabe, D & Gagne, J.P. (2013). *What’s in a name? Dual sensory Impairment or deafblindness*? British Journal of Visual Impairment. 31(3), pp. 198-207

Yang, C., Rusli, E. (2012). *Teacher Training In Using Effective Strategies For Preschool Children With Disabilities In Inclusive Classrooms*.  Journal of College Teaching & Learning (Online). 9 (1), pp.53

Young, K., McNamara, P., Coughlan B. (2017). *Post-primary school teachers’ knowledge and understanding of autism spectrum disorders.* Irish Educational Studies. 36(3), pp.399-422

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **APPENDIX 1****MCQ** Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_              Pre-Test Post-Test (circle one)  Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  **Please answer each question by circling only one (1) answer.**   1. Deafblindness means total deafness plus total blindness.    1. TRUE    2. FALSE 2. Deafblindness is caused by:    1. Genetic syndromes    2. Problems during birth    3. Aging    4. All of the above 3. Hearing and vision are considered our…..:    1. Near senses    2. Distance senses    3. Tactile senses    4. None of the above 4. There is a teacher training program in Ireland for Teachers of Deafblind    1. TRUE    2. FALSE 5. Students with hearing loss may benefit from all of the following except:    1. Cochlear Implants    2. Fm systems    3. Magnifiers    4. Hearing aids 6. Students with visual impairment can be more successful at school when they have the  following:    1. Prescribed glasses    2. Proper lighting    3. Enlarged print    4. Assistive technology (laptop, tablet) 7. Children who are Deafblind lack **incidental learning** because:    1. Their parents didn’t talk to them when they were babies    2. They all have additional cognitive impairments    3. They are unable to “overhear” and “oversee” what is going on around them    4. They can’t walk or learn to walk 8. A student who is Deafblind might communicate to others by:    1. Pointing to a picture    2. Touching an object    3. Pressing a switch with voice output    4. Making a face    5. All of the above 9. Which of the following skills is the most important to teach a child who is Deafblind?    1. Planets of the Solar System    2. French word for “toilet”    3. Which food they want for lunch    4. How to read a map 10. Which of the following would not be a strategy that works well when teaching a student who is Deafblind?     1. Offering choices     2. Clear beginning/middle/end of a lesson/activity     3. Hand over hand assistance     4. Turn taking  **APPENDIX 2****PRE AND POST TRAINING QUESTIONNAIRE** **PRE-TRAINING SURVEY**  Anne Sullivan Logo.jpg  **TEACHING COUNCIL OF IRELAND RESEARCH STUDY**  **Supporting children who are deafblind in a classroom setting: the impact of training teaching staff in specific strategies**  **Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **Q1. Please select an answer below:**  Are you:  a) A teacher  b) An SNA  c) A learning resource teacher  d) Other (Please specify)    **Q2. Do you use any other terms that have the same meaning as deafblind? Eg. dual sensory loss, multisensory loss/impairment**    **Q3. Do you have a child/family member who is deafblind (has hearing and vision loss)?**  Please tick:  Yes: \_\_\_\_\_  No:  \_\_\_\_\_  **Q4. To what extent has your training to date equipped you to support children who are deafblind/who have dual sensory loss?**  1= Not at all         2= Very little 3= Somewhat       4=To a great extent  Rating:\_\_\_\_\_\_\_\_\_\_\_\_  Please provide any further details you have about strategies you have been trained in      **Q5. How knowledgeable are you about the condition of deafblindness**  1=Not at all         2= Very little 3= Somewhat      4=To a great extent  Rating: \_\_\_\_\_\_\_\_\_\_\_\_\_      **Q6. How informed are you on the strategies that can support children are deafblind?**  1=Not at all     2= Very little     3= Somewhat 4=To a great extent  Rating: \_\_\_\_\_\_\_\_\_\_\_\_    **Q7: If you had to write a list about everything you know about deafblindness, how long would that list be?**  1= Very short       2=Short 3= Long          4= Very long  Rating: \_\_\_\_\_\_\_\_\_\_\_    **Q8. Please state the extent to which you agree or disagree with the statements below:**  **1= Strongly disagree   2= Disagree 3= N/A   4= Agree 5= Strongly agree**  I can recognise when a child is deafblind……**Rating: \_\_\_\_\_\_\_\_\_\_**  I am aware of the specialist support services a child who is deafblind can avail of….**Rating: \_\_\_\_\_\_\_**  I can identify the essential components of an IEP for a child who is deafblind….**Rating: \_\_\_\_\_\_\_\_**  I can identify the kinds of communication supports that a child who is deafblind may need…**Rating\_\_\_\_\_\_\_**  I can identify the kinds of social supports that a child who is deafblind may need…**Rating:\_\_\_\_\_\_\_\_\_**  I am confident that I can create a safe and supportive school environment for a child who is deafblind….**Rating:\_\_\_\_\_\_\_\_**  I can provide appropriate training to other teaching personnel who support a child who is deafblind….**Rating\_\_\_\_\_\_\_\_\_**  I have the skills to effectively support a child who is deafblind……**Rating\_\_\_\_\_\_\_\_\_**  **Thank you for taking this survey!**  **TEACHING COUNCIL OF IRELAND RESEARCH STUDY**  **POST-TRAINING SURVEY**  Anne Sullivan Logo.jpg  **Supporting children who are deafblind in a classroom setting: the impact of training teaching staff in specific strategies**  **Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **Date you received training:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **Q1. Please read the statements below and indicate the extent to which you agree with each one**  **1= Strongly disagree    2= Disagree 3= Neither agree or disagree    4= Agree 5= Strongly agree**   * This training experience will be useful in my work….Rating: \_\_\_\_\_\_\_\_\_\_\_ * I plan on using at least one of the taught strategies over the next four weeks….Rating:\_\_\_\_\_\_\_\_\_\_     **Q2.** **Please state the extent to which you now agree or disagree with the statements below:**  **1= Strongly disagree   2= Disagree 3= N/A   4= Agree 5= Strongly agree**  I can recognise when a child is deafblind……**Rating: \_\_\_\_\_\_\_\_\_\_**  I am aware of the specialist support services a child who is deafblind can avail of….**Rating: \_\_\_\_\_\_\_**  I can identify the essential components of an IEP for a child who is deafblind….**Rating: \_\_\_\_\_\_\_\_**  I can identify the kinds of communication supports that a child who is deafblind may need…**Rating\_\_\_\_\_\_\_**  I can identify the kinds of social supports that a child who is deafblind may need…**Rating:\_\_\_\_\_\_\_\_\_**  I am confident that I can create a safe and supportive school environment for a child who is deafblind….**Rating:\_\_\_\_\_\_\_\_**  I can provide appropriate training to other teaching personnel who support a child who is deafblind….**Rating\_\_\_\_\_\_\_\_\_**  I have the skills to effectively support a child who is deafblind……**Rating\_\_\_\_\_\_\_\_\_**    **Q3. To what extent has your training to date equipped you to support children who are deafblind?**  1= Not at all         2= Very little 3= Somewhat       4=To a great extent  Rating:\_\_\_\_\_\_\_\_\_\_\_\_    **Q4. How knowledgeable are you about the condition of deafblindness**  1=Not at all         2= Very little 3= Somewhat      4=To a great extent  Rating: \_\_\_\_\_\_\_\_\_\_\_\_\_    **Q5. How informed are you on the strategies that can support children are deafblind?**  1=Not at all     2= Very little     3= Somewhat 4=To a great extent  Rating: \_\_\_\_\_\_\_\_\_\_\_\_    **Q6: If you had to write a list about everything you know about deafblindness, how long would that list be?**  1= Very short       2=Short 3= Long          4= Very long  Rating: \_\_\_\_\_\_\_\_\_\_\_    **Q7: Do you think any of the strategies taught in today’s training course would be useful in supporting children who have other types of disabilities?**  1= Not at all      2= Very little 3=Somewhat       4=To a great extent  Rating: \_\_\_\_\_\_\_\_\_\_\_\_\_\_    The Anne Sullivan Centre would greatly appreciate your participation in a follow-up survey in approximately 4-5 weeks time. With your permission, we will contact you by phone to see if you have had an opportunity to implement any of the strategies that were taught during this training. We expect the phone call to last no more than 10 minutes. By agreeing to provide feedback in this way, you will be helping us to understand the impact that the training has on the children you support and this in turn will inform the content of teacher training in the future.  If you are happy to receive a phone call in 4-5 weeks time, please provide your phone number and email (in case we need to arrange a call through email) below.  Thank you!  Phone number: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Email address: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **APPENDIX 3****JASP RESULTS** **Reliability Analysis**   | **Scale Reliability Statistics measuring participants knowledge levels** | | | | | | | --- | --- | --- | --- | --- | --- | |  | | **sd** | | **Cronbach's α** | | | scale |  | 0.352 |  | 0.682 |  | |  | | | | | |  | **Scale Reliability Statistics measuring participants level of self-confidence** | | | | | | | --- | --- | --- | --- | --- | --- | |  | | **sd** | | **Cronbach's α** | | | scale |  | 0.357 |  | 0.803 |  | |  | | | | | | | *Note.*  Of the observations, 47 were used, 0 were excluded listwise, and 47 were provided. | | | | | |   **Descriptive Statistics** | | | | | | | | | |
|  | | **Role** | | **Type of School** | | **Age** | | **Gender** | |
| **Valid** |  | 47 |  | 47 |  | 47 |  | 47 |  |
| **Missing** |  | 1 |  | 1 |  | 1 |  | 1 |  |
| **Mean** |  | 1.617 |  | 1.064 |  | 3.383 |  | 1.936 |  |
| **Std. Deviation** |  | 0.491 |  | 0.247 |  | 0.990 |  | 0.247 |  |
| **Minimum** |  | 1.000 |  | 1.000 |  | 2.000 |  | 1.000 |  |
| **Maximum** |  | 2.000 |  | 2.000 |  | 5.000 |  | 2.000 |  |
|  | | | | | | | | | |

**Frequencies**

| **Frequencies for Role** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Role** | | **Frequency** | | **Percent** | | **Valid Percent** | | **Cumulative Percent** | |
| 1 |  | 18 |  | 37.500 |  | 38.298 |  | 38.298 |  |
| 2 |  | 29 |  | 60.417 |  | 61.702 |  | 100.000 |  |
| Missing |  | 1 |  | 2.083 |  |  |  |  |  |
| Total |  | 48 |  | 100.000 |  |  |  |  |  |
|  | | | | | | | | | |

 1= Teachers 2=SNA

| **Frequencies for Type of School** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Type of School** | | **Frequency** | | **Percent** | | **Valid Percent** | | **Cumulative Percent** | |
| 1 |  | 44 |  | 91.667 |  | 93.617 |  | 93.617 |  |
| 2 |  | 3 |  | 6.250 |  | 6.383 |  | 100.000 |  |
| Missing |  | 1 |  | 2.083 |  |  |  |  |  |
| Total |  | 48 |  | 100.000 |  |  |  |  |  |
|  | | | | | | | | | |

 1=Special School 2= Mainstream school

| **Frequencies for Age** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Age** | | **Frequency** | | **Percent** | | **Valid Percent** | | **Cumulative Percent** | |
| 2 |  | 9 |  | 18.750 |  | 19.149 |  | 19.149 |  |
| 3 |  | 19 |  | 39.583 |  | 40.426 |  | 59.574 |  |
| 4 |  | 11 |  | 22.917 |  | 23.404 |  | 82.979 |  |
| 5 |  | 8 |  | 16.667 |  | 17.021 |  | 100.000 |  |
| Missing |  | 1 |  | 2.083 |  |  |  |  |  |
| Total |  | 48 |  | 100.000 |  |  |  |  |  |
|  | | | | | | | | | |

1=18-25; 2=26-34; 3=35-44; 4=45-54 5=55-65

| **Frequencies for Gender** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Gender** | | **Frequency** | | **Percent** | | **Valid Percent** | | **Cumulative Percent** | |
| 1 |  | 3 |  | 6.250 |  | 6.383 |  | 6.383 |  |
| 2 |  | 44 |  | 91.667 |  | 93.617 |  | 100.000 |  |
| Missing |  | 1 |  | 2.083 |  |  |  |  |  |
| Total |  | 48 |  | 100.000 |  |  |  |  |  |
|  | | | | | | | | | |

**1=Male 2=Female**

**Reliability Analysis**

| **Scale Reliability Statistics measuring participants knowledge** | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | | **sd** | | **Cronbach's α** | | | |
| scale |  | 0.313 |  | 0.843 | |  | |
|  | | | | | | | |
| *Note.*  Of the observations, 47 were used, 0 were excluded listwise, and 47 were provided. | | | | | | | |
| **Scale Reliability Statistics measuring participants level of self-confidence** | | | | | | | |
|  | | | **sd** | | **Cronbach's α** | | |
| scale | |  | 0.357 |  | 0.803 | |  |
|  | | | | | | | |
| *Note.*  Of the observations, 47 were used, 0 were excluded listwise, and 47 were provided. | | | | | | | |

**Results from the post survey**

| **Descriptive Statistics** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | **Usefulness of training** | | **Plan to use** | | **Feel equipped** | | **Transferable?** | |
| **Valid** |  | 47 |  | 47 |  | 47 |  | 47 |  |
| **Missing** |  | 0 |  | 0 |  | 0 |  | 0 |  |
| **Mean** |  | 4.532 |  | 4.319 |  | 3.489 |  | 3.851 |  |
| **Std. Deviation** |  | 0.546 |  | 0.935 |  | 0.655 |  | 0.360 |  |
| **Minimum** |  | 3.000 |  | 1.000 |  | 2.000 |  | 3.000 |  |
| **Maximum** |  | 5.000 |  | 5.000 |  | 5.000 |  | 4.000 |  |
|  | | | | | | | | | |

**ANOVA- Pre questionnaire**

| **ANOVA - Mean knowledge** | | | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Cases** | | **Sum of Squares** | | **df** | | **Mean Square** | | **F** | | **p** | | **η²** | |
| Yrs experience db |  | 1.000 |  | 4.000 |  | 0.250 |  | 0.641 |  | 0.637 |  | 0.056 |  |
| Role |  | 0.010 |  | 1.000 |  | 0.010 |  | 0.025 |  | 0.874 |  | 0.001 |  |
| Yrs experience db ✻ Role |  | 2.452 |  | 4.000 |  | 0.613 |  | 1.572 |  | 0.202 |  | 0.137 |  |
| Residual |  | 14.431 |  | 37.000 |  | 0.390 |  |  |  |  |  |  |  |
|  | | | | | | | | | | | | | |
| *Note.*  Type III Sum of Squares | | | | | | | | | | | | | |

**ANOVA**

| **ANOVA - Mean conf** | | | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Cases** | | **Sum of Squares** | | **df** | | **Mean Square** | | **F** | | **p** | | **η²** | |
| Yrs experience db |  | 0.665 |  | 4.000 |  | 0.166 |  | 0.334 |  | 0.853 |  | 0.030 |  |
| Role |  | 0.381 |  | 1.000 |  | 0.381 |  | 0.765 |  | 0.387 |  | 0.017 |  |
| Yrs experience db ✻ Role |  | 2.415 |  | 4.000 |  | 0.604 |  | 1.214 |  | 0.322 |  | 0.110 |  |
| Residual |  | 18.409 |  | 37.000 |  | 0.498 |  |  |  |  |  |  |  |
|  | | | | | | | | | | | | | |
| *Note.*  Type III Sum of Squares | | | | | | | | | | | | | |

**ANOVA Post questionnaire**

| **ANOVA - Mean knowledge** | | | | | | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Cases** | | **Sum of Squares** | | | **df** | | **Mean Square** | | | | **F** | | **p** | | **η²** | |
| Role |  | 2.218 | |  | 1.000 |  | 2.218 | | |  | 18.897 |  | < .001 |  | 0.286 |  |
| Yrs Exper |  | 0.226 | |  | 4.000 |  | 0.056 | | |  | 0.481 |  | 0.749 |  | 0.029 |  |
| Role ✻ Yrs Exper |  | 0.840 | |  | 3.000 |  | 0.280 | | |  | 2.384 |  | 0.084 |  | 0.108 |  |
| Residual |  | 4.461 | |  | 38.000 |  | 0.117 | | |  |  |  |  |  |  |  |
|  | | | | | | | | | | | | | | | | |
| *Note.*  Type III Sum of Squares | | | | | | | | | | | | | | | | |
| *Warning.*  Singular fit encountered; one or more predictor variables are a linear combination of other predictor variables  **ANOVA- Mean conf levels** | | | | | | | | | | | | | | | | |
| **Cases** | | | **Sum of Squares** | | | | | **df** | | **Mean Square** | | **F** | | **p** | | **η²** | |
| Role |  | | 0.338 | | | |  | 1.000 |  | 0.338 |  | 2.395 |  | 0.130 |  | 0.053 |  |
| Yrs Exper |  | | 0.297 | | | |  | 4.000 |  | 0.074 |  | 0.526 |  | 0.717 |  | 0.047 |  |
| Role ✻ Yrs Exper |  | | 0.333 | | | |  | 3.000 |  | 0.111 |  | 0.787 |  | 0.509 |  | 0.053 |  |
| Residual |  | | 5.365 | | | |  | 38.000 |  | 0.141 |  |  |  |  |  |  |  |
|  | | | | | | | | | | | | | | | | | |
| *Note.*  Type III Sum of Squares | | | | | | | | | | | | | | | | | |
| *Warning.*  Singular fit encountered; one or more predictor variables are a linear combination of other predictor variables | | | | | | | | | | | | | | | | | |

**Linear Regression**

**(Impact of previous training on knowledge)**

| **Model Summary** | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Model** | | **R** | | **R²** | | **Adjusted R²** | | **RMSE** | | | |
| 1 |  | 0.691 |  | 0.478 |  | 0.466 |  | 0.454 | | |  |
|  | | | | | | | | | | | |
| **ANOVA** | | | | | | | | | | | | | | | | |
| **Model** | |  | | | **Sum of Squares** | | | | **df** | | **Mean Square** | | **F** | | **p** | |
| 1 |  | Regression | |  | 8.491 | | |  | 1 |  | 8.491 |  | 41.162 |  | < .001 |  |
|  |  | Residual | |  | 9.282 | | |  | 45 |  | 0.206 |  |  |  |  |  |
|  |  | Total | |  | 17.773 | | |  | 46 |  |  |  |  |  |  |  |
|  | | | | | | | | | | | | | | | | |

| **Coefficients** | | | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Model** | |  | | **Unstandardized** | | **Standard Error** | | **Standardized** | | **t** | | **p** | |
| 1 |  | (Intercept) |  | 0.839 |  | 0.250 |  |  |  | 3.363 |  | 0.002 |  |
|  |  | Prev training |  | 0.625 |  | 0.097 |  | 0.691 |  | 6.416 |  | < .001 |  |
|  | | | | | | | | | | | | | |

**Linear Regression**

**(Impact of previous training on confidence levels)**

| **Model Summary** | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Model** | | **R** | | **R²** | | **Adjusted R²** | | **RMSE** | | | |
| 1 |  | 0.502 |  | 0.252 |  | 0.236 |  | 0.607 | | |  |
|  | | | | | | | | | | | |
| **ANOVA** | | | | | | | | | | | | | | | | |
| **Model** | |  | | | **Sum of Squares** | | | | **df** | | **Mean Square** | | **F** | | **p** | |
| 1 |  | Regression | |  | 5.592 | | |  | 1 |  | 5.592 |  | 15.195 |  | < .001 |  |
|  |  | Residual | |  | 16.559 | | |  | 45 |  | 0.368 |  |  |  |  |  |
|  |  | Total | |  | 22.151 | | |  | 46 |  |  |  |  |  |  |  |
|  | | | | | | | | | | | | | | | | |

| **Coefficients** | | | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Model** | |  | | **Unstandardized** | | **Standard Error** | | **Standardized** | | **t** | | **p** | |
| 1 |  | (Intercept) |  | 1.758 |  | 0.333 |  |  |  | 5.273 |  | < .001 |  |
|  |  | Prev training |  | 0.508 |  | 0.130 |  | 0.502 |  | 3.898 |  | < .001 |  |
|  | | | | | | | | | | | | | |

**Linear Regression**

**(Impact of knowledge on confidence levels)**

| **Model Summary** | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Model** | | **R** | | **R²** | | **Adjusted R²** | | **RMSE** | | | |
| 1 |  | 0.585 |  | 0.342 |  | 0.327 |  | 0.569 | | |  |
|  | | | | | | | | | | | |
| **ANOVA** | | | | | | | | | | | | | | | | |
| **Model** | |  | | | **Sum of Squares** | | | | **df** | | **Mean Square** | | **F** | | **p** | |
| 1 |  | Regression | |  | 7.571 | | |  | 1 |  | 7.571 |  | 23.369 |  | < .001 |  |
|  |  | Residual | |  | 14.580 | | |  | 45 |  | 0.324 |  |  |  |  |  |
|  |  | Total | |  | 22.151 | | |  | 46 |  |  |  |  |  |  |  |
|  | | | | | | | | | | | | | | | | |

| **Coefficients** | | | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Model** | |  | | **Unstandardized** | | **Standard Error** | | **Standardized** | | **t** | | **p** | |
| 1 |  | (Intercept) |  | 1.455 |  | 0.332 |  |  |  | 4.380 |  | < .001 |  |
|  |  | knowledge |  | 0.653 |  | 0.135 |  | 0.585 |  | 4.834 |  | < .001 |  |
|  | | | | | | | | | | | | | |

**Linear Regression**

**(Impact of confidence levels on knowledge)**

| **Model Summary** | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Model** | | **R** | | **R²** | | **Adjusted R²** | | **RMSE** | | | |
| 1 |  | 0.585 |  | 0.342 |  | 0.327 |  | 0.510 | | |  |
|  | | | | | | | | | | | |
| **ANOVA** | | | | | | | | | | | | | | | | |
| **Model** | |  | | | **Sum of Squares** | | | | **df** | | **Mean Square** | | **F** | | **p** | |
| 1 |  | Regression | |  | 6.075 | | |  | 1 |  | 6.075 |  | 23.369 |  | < .001 |  |
|  |  | Residual | |  | 11.698 | | |  | 45 |  | 0.260 |  |  |  |  |  |
|  |  | Total | |  | 17.773 | | |  | 46 |  |  |  |  |  |  |  |
|  | | | | | | | | | | | | | | | | |

| **Coefficients** | | | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Model** | |  | | **Unstandardized** | | **Standard Error** | | **Standardized** | | **t** | | **p** | |
| 1 |  | (Intercept) |  | 0.806 |  | 0.335 |  |  |  | 2.410 |  | 0.020 |  |
|  |  | confidence |  | 0.524 |  | 0.108 |  | 0.585 |  | 4.834 |  | < .001 |  |
|  | | | | | | | | | | | | | |

**Bayesian Paired Samples T-Test**

**(Knowledge levels)**

| **Bayesian Paired Samples T-Test** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | |  | |  | | **BF₁₀** | | **error %** | |
| Measure 1 |  | - |  | Measure 2 |  | 9.417e +8 |  | 1.082e -11 |  |
|  | | | | | | | | | |

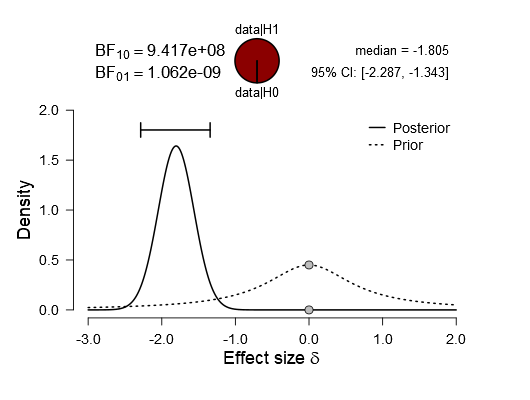
**Descriptives**

| **Descriptives** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | **N** | | **Mean** | | **SD** | | **SE** | |
| Measure 1 |  | 47 |  | 2.383 |  | 0.622 |  | 0.091 |  |
| Measure 2 |  | 47 |  | 3.348 |  | 0.423 |  | 0.062 |  |
|  | | | | | | | | | |

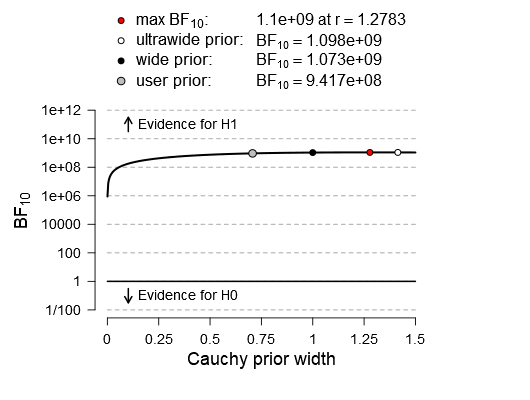
**Inferential Plots**

**Measure 1 - Measure 2**

**Prior and Posterior**



**Bayes Factor Robustness Check**



**Bayesian Paired Samples T-Test**

**(Confidence levels)**

| **Bayesian Paired Samples T-Test** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | |  | |  | | **BF₁₀** | | **error %** | |
| Measure 1 |  | - |  | Measure 2 |  | 3.725e +10 |  | 5.036e -14 |  |
|  | | | | | | | | | |

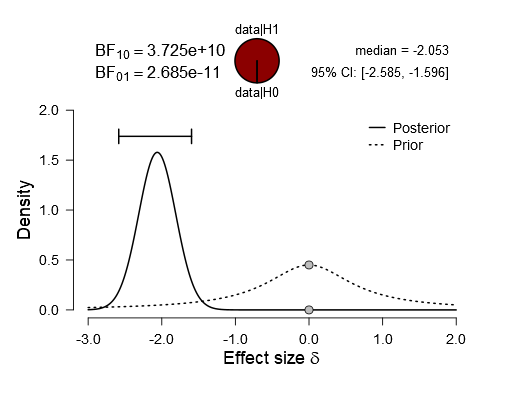
**Descriptives**

| **Descriptives** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | **N** | | **Mean** | | **SD** | | **SE** | |
| Measure 1 |  | 47 |  | 3.011 |  | 0.694 |  | 0.101 |  |
| Measure 2 |  | 47 |  | 4.120 |  | 0.380 |  | 0.055 |  |
|  | | | | | | | | | |

**Inferential Plots**

**Measure 1 - Measure 2**

**Prior and Posterior**



**Bayes Factor Robustness Check**

