



University of Dundee

Impact of training in Autism on inclusive practices

Hannah, Elizabeth; Nolan, Amy

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Impact of training in Autism on inclusive practices

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Abstract

Purpose

This research evaluates the impact of training on educational staff attitudes, sentiments, concerns, and efficacy in providing support for children with Autism in mainstream settings.

Design/methodology/approach

The investigation adopted a pre-test/post-test, quasi-experimental, within-subject research design. Thirty-five early years educators, teachers and pupil support assistants from one Scottish Local Authority (LA) undertook training delivered by the LA's Communication and Language Outreach Service. Measures included the Sentiments, Attitudes, and Concerns about Inclusive Education Revised (SACIE-R) scale and the Teacher Efficacy for Inclusive Practices (TEIP) scale pre and post-training. Post-training participants completed a questionnaire employing open and closed questions to assess perceived usefulness of training, application of knowledge, and effectiveness of the teaching strategies.

Findings

Combining data from the three sectors there was a significant change in staff efficacy for inclusive practices ($Z = -3.406$, $p = 0.001$, $p < 0.05$, with a medium effect size $r = 0.41$) although there were differences between the sectors. There was a significant change in SACIE-R total scores ($Z = -3.945$, $p = 0.000$, $p < 0.05$; with a medium effect size $r = 0.47$), sentiments ($Z = -2.763$, $p = 0.006$, $p < 0.05$; with a medium effect size $r = 0.33$) and concerns ($Z = -3.685$, $p = 0.000$, $p < 0.05$; with a medium effect size of $r = 0.44$) subscale scores for the combined sector data. There was no significant change in the attitudes subscale scores for the combined sector data ($Z = -1.106$, $p = 2.69$, $p > 0.05$; with a small effect size $r = 0.13$) although there were differences between the sectors.

Research limitations

Limitations include: small sample size, minor differences in the training in different sectors, purposeful sampling, use of questionnaire post training, variability of completion of SCAIE-R and TEIP post training

Originality/value

There appears to be limited research into inclusive practices for children with Autism in the UK context, which this study aims to address.

Keywords: inclusion; Autism; training; attitudes, teacher efficacy

Introduction

There are various policies and legislation that promote inclusive education. On an international level, the Salamanca Statement and Article 24 of the United Nations Convention on the Rights of Persons with Disabilities advocate inclusive education for children with disabilities (UNESCO, 1994; UN, 2006). This is echoed at a UK and Scottish level, with legislation, policy and curricular developments promoting inclusion and inclusive practices, e.g. the Equality Act 2010, the Standards in Scotland's Schools etc Act 2000.

Translating legislation and policy into practice at school level is key to successful implementation of inclusive practices (Sharma et al., 2006). In recent years, there has been a clear shift in research on inclusive education from justifying inclusive approaches to consideration of how it can be achieved (Forlin, Sharma, and Loreman, 2014). Sharma et al. (2006) suggest that in order to be successful inclusion needs commitment from all stakeholders including governments, teachers and schools. Similarly, Avramidis et al. (2002) propose that the views of personnel implementing inclusion are important for successful implementation. Research indicates that teachers' attitudes and beliefs are vital factors (Avramidis et al., 2000; Avramidis et al., 2002; Rakap and Kaczmarek, 2010).

Teachers' attitudes, sentiments and concerns about inclusive education

A strong predictor of the success of inclusive education is positive attitudes from educators towards the inclusion of pupils with additional support needs (ASN) in the mainstream class/school (Forlin et al., 2011). Attitudes can be defined as stable learned dispositions resulting in responses to a person, situation or other prompts which are constant in nature (Corsini, 1999). Teachers with positive attitudes towards inclusion adapt the way they work to meet the needs of pupils (Boyle, Topping, and Jindal-Snape, 2013; Sharma, Forlin, and Loreman, 2008; Sharma et al., 2006); and teachers with positive attitudes towards the inclusion of pupils with ASN in the mainstream setting can positively influence the attitudes of pupils towards their peers with ASN (Norwicki and Sandieson, 2002).

Several factors influence educators' attitudes towards the inclusion of pupils with ASN. Avramidis et al. (2002) suggest these can be grouped into child-related variables, teacher-related variables and educational environment-related variables. Child-related variables include the type and complexity of ASN (Rakap and Kaczmarek, 2010). For example, Avramidis et al. (2002) report that teachers displayed more positive attitudes towards the inclusion of pupils with physical needs compared to pupils with social, emotional and behavioural needs.

Teacher-related variables include grade level taught, stress levels, experience of contact with pupils with ASN and training. Research suggests that grade level or school stage taught has an influence on teachers' attitudes to inclusive education which becomes more negative as school stage level increases (Rakap and Kaczmarek, 2010). This finding could be attributed to a greater focus on subject matter at later school stages (Round, Subban, and Sharma, 2016), a bigger teacher team, mounting performance pressure (Bešić, Paleczek, Krammer, and Gasteiger-

Klicpera, 2017), and increased stress levels (Galaterou and Antoniou, 2017). Teachers' experience of working with a child with ASN in a mainstream setting has been found to influence their attitudes (Avramidis et al., 2010; Bešić et al. 2017). This has been attributed to an increase in teachers' confidence and mastery skill levels (Le Roy and Simpson, 1996; Villa et al., 1996) and hence the importance of training for teachers in supporting pupils with ASN (Avramidis et al., 2002; Forlin, Loreman, and Sharma, 2014; Sharma et al., 2008).

Educational environment-related variables include physical and human supports (Bešić et al., 2017; Rakap et al., 2010; Round et al., 2016). Physical support includes resources, a restructured environment and teaching materials. Human support includes specialised teachers, pupil support assistants and agencies such as Educational Psychology and Speech and Language Therapy (Avramidis et al., 2002). Avramidis et al.'s (2002) literature review found consistent support for restructuring the mainstream environment to include pupils with ASN. Obstacles to inclusion were lack of resources such as time and human resources (Avramidis et al., 2000).

Previous research has linked teachers' sentiments and concerns to teachers' attitudes towards the inclusion of pupils with ASN (Forlin et al., 2011; Sharma et al., 2008; Sharma et al., 2006). Sharma et al. (2006) describe sentiments as levels of comfort/discomfort interacting with a person with ASN. Loreman et al. (2007) propose that in order to ensure successful inclusive practices it is important that teachers develop positive sentiments about inclusion. There is some evidence that educators' sentiments and concerns about a pupil's ASN correlate with successful inclusive practices (Forlin et al., 2011). Research has found a negative correlation between participants' concerns and attitudes to teaching in inclusive environments in that positive attitudes towards inclusive education correlate with fewer concerns (Changpinit, Greaves, and Frydenberg, 2007). Educators' concerns include a perceived skills deficit in teaching pupils with ASN and a lack of resources (Agbenyega, 2007).

Teacher efficacy

Bandura developed self-efficacy theory in the 1970s. The following decade, social cognitive theory focused on the important role of cognitions in learning and behaviour with self-efficacy remaining a key component (Bandura, 1986). Bandura (1997) describes self-efficacy as the belief an individual has about their own capabilities and suggests that four main sources affect efficacy beliefs and ultimately behaviour. These are mastery experiences (a person has shown capability in a task and believes they will be able to do this in the future), vicarious experience (human modelling), social persuasion (being told by another person that they have the ability to perform well), and physiological arousal (arousal from our senses) (Bandura, 1986).

In order for teachers to implement inclusive practices, Forlin, Sharma, and Loreman, (2014) suggest they must hold self-efficacy beliefs. Judgements about teaching tasks and the learning environment are influenced by teachers' perceived efficacy (Bandura, 1997). Furthermore, Sharma et al. (2012) deduce that high teacher efficacy in implementing inclusive practices leads to the belief that pupils with ASN

can be taught in the mainstream class effectively and vice versa. They advocate that teachers' actions are influenced by their perceived efficacy and high teacher efficacy is described as an essential component of an inclusive environment.

A number of researchers have postulated a link between perceived teacher efficacy for inclusive practice and attitudes (Boyle et al. 2013; Forlin et al., 2009; Forlin, Sharma, and Loreman, 2014; Sharma et al., 2012). Forlin et al. (2009) found that the best predictor of pre-service teachers' attitudes was confidence in teaching in inclusive environments and proposed that initial teacher education should focus on improving the efficacy of their students in inclusive educational practice. Similarly, Sharma et al. (2012) state that an improvement in pre-service teachers' attitudes towards teaching in an inclusive environment is related to perceived teacher efficacy. Boyle et al. (2013) also emphasise the importance that teacher attitudes play in achieving successful inclusive practices. Forlin et al (2014) argue that having a better understanding of factors underpinning perceived teacher efficacy beliefs can lead to the development of more positive attitudes towards inclusion.

One of the hypothesised factors underpinning perceived teacher efficacy is professional development. There is some evidence that perceived teacher efficacy can be improved by training (Boyle et al. 2013; Forlin, Loreman, and Sharma 2014; Forlin, Sharma, and Loreman, 2014). Boyle et al. (2013) UK study suggests that training in special education can have a positive impact on teachers' inclusive practices. Similarly, Forlin, Loreman and Sharma's (2014) study on professional learning about inclusion in Hong Kong conclude that positive gains were made in teachers' perceived efficacy in inclusive practices post training. Also, Forlin, Sharma, and Loreman's (2014) found that a course in inclusive education was successful in improving perceived teacher efficacy for inclusive practice regardless of demographic variables.

However, Wyatt (2014) highlights that several research studies conducted on teacher efficacy pre 1997 had construct validity issues. Tschannen-Moran, Hoy, and Hoy (1998) state that early research on teacher efficacy focused on general teacher efficacy (GTE) and personal teacher efficacy (PTE). GTE refers to a teacher's belief about teachers' efficacy in general whereas PTE refers to a teacher's belief about their own efficacy. Bandura (1997) claims that teachers' beliefs about their personal efficacy should be measured rather than general teacher efficacy, as external control is unrelated to self-efficacy. As a result of this, papers post 1997 have focused on PTE.

Teacher efficacy in teaching pupils with Autism

Autism is a spectrum condition and common in the UK (NAS, n.d.). Based on two prevalence studies since 2006, it is suggested that 1.1% of the population in the UK may be on the autism spectrum (NAS, n.d.). Children with Autism have language and communication difficulties including difficulties with social interaction, thinking and communication (Baron-Cohen, 2008; Emam and Farrell, 2009; Lo et al., 2014; McGillicuddy and O'Donnell, 2014). These difficulties may impact upon a child's ability to access mainstream education, and it is vital staff have the knowledge and skills to meet their needs.

Increasing numbers of children with Autism are being educated in mainstream provisions (Emam, 2014). However, there appears to be a paucity of research investigating teachers' self-efficacy in relation to teaching pupils with Autism. Lo et al.'s (2014) study on teachers' perspectives on teaching pupils with Autism found higher efficacy levels in teachers who had more confidence, fewer concerns, and more experience in teaching pupils with Autism. A Scottish study by McGregor and Campbell (2001), investigating teachers' attitudes to the integration of Autistic pupils in mainstream schools, found that teachers who had previous experience of teaching pupils with Autism were more confident than those without that experience.

Previous studies have found differences in teachers' attitudes towards inclusive education linked to school stage but have not focused on the views of pre-school staff. Furthermore, there is a gap in research in inclusive practices in relation to Autism in the Scottish context. Although McGregor and Campbell (2001) focused on teachers' attitudes to the integration of pupils with Autism in the mainstream school, Forlin, Sharma, and Loreman (2014) state that research on inclusive education is shifting from justifying approaches to focusing on how to make schools more inclusive. Thus, the present study focuses on differences in staff attitudes to supporting children with Autism by sector and the impact of training on staff's knowledge of strategies to support inclusive practice in relation to children with Autism in the Scottish context.

The study aimed to assess the impact of a training programme on:

1. School staff's attitudes, sentiments and concerns in supporting pupils with Autism in the mainstream class/school, and whether there are differences between staff groups in the different sectors.
2. School staff's efficacy in supporting pupils with Autism in the mainstream class/school, and whether there are differences between staff groups in the different sectors.

The third aim was to investigate:

3. School staff's perceptions of the usefulness of the training, application of knowledge, and effectiveness of strategies

Method

Design and Ethics

The study adopted a pre-test/post-test, quasi-experimental, within-subject research design. A number of ethical considerations were incorporated into the design of the study including: informed written consent, participants having the right to withdraw from the study at any time, and anonymity of participants. The study was approved by the ethics committee of the authors' education institution and permissions at local authority (LA) and school levels.

Participants

Sampling was purposive. Participants, drawn from five educational establishments in one LA in Scotland, were recipients of training provided by the pre-existing LA's Communication and Language Outreach Service (COS). The researchers were not

involved in the delivery of the training. All participants had previous experience working with pupils with ASN within a mainstream establishment. In Scotland, in 2017, there were 183491 pupils with ASN. Most pupils with ASN are educated in mainstream establishments (Scottish Government, 2017) thus all the participants would have experience working with children with ASN. A total of 35 participants completed pre and post intervention measures (17 from nursery sector, 5 from primary sector and 13 from secondary sector). Experience ranged from 3 years to >21 years (nursery), 1 year to >21 years (primary) and 3 years to >21 years (secondary).

INSERT TABLE 1 HERE

Table 1 details participants involved in training. In the nursery sector, four of the participants were heads or depute heads; in the primary sector one of the participants was the head teacher; and in the secondary sector there was a depute head teacher and a principal teacher.

Staff cover impacted on numbers able to take up places in two of the nurseries. One primary participant did not attend all the training and did not complete the measures.

The clerical staff member in the secondary school did not complete the pre and post measures as they were aimed at teaching and support staff.

Training

The pilot training programme was developed and implemented by the LA COS in five schools from the nursery, primary and secondary sectors. The COS comprises teachers with extensive experience of working with staff in educational establishments to support the inclusion of pupils with communication and language difficulties. The overall approach to the training was underpinned by Bandura's social cognitive theory, and utilised three of the four sources of self-efficacy, namely mastery experiences, vicarious experiences and social persuasion. It aimed to

- Develop a shared understanding of how a child with Autism experiences the world and what underlies behaviour and development.
- Provide guidance on how to improve communication with children who have Autism.
- Coach staff in analysis of behaviour in order to develop communication centred strategies that will support children.
- Provide an opportunity for professional dialogue to enable staff to develop universal and targeted support for children with Autism.

Nursery training was delivered over four consecutive weeks (one half-day session and three 2 hour twilight sessions). The primary and secondary training comprised four two hour sessions over consecutive weeks, although there was an additional forward planning session for teaching staff in the secondary school. Additionally, the LA COS offered establishments termly follow up sessions to support the implementation of strategies and a consultation service via phone or email. Having the training delivered over four sessions provided an opportunity for staff to consolidate their knowledge and understanding and begin to implement some of the

strategies in their classes/establishments thus offering mastery experiences. Learning about different approaches from experienced teachers during the training sessions and being supported through a consultation service provided vicarious experiences and social persuasion.

The following topics were covered during the training sessions: (1) An overview of inclusive practice in education, covering policy and legislation, conceptual aspects, evidence base, factors underpinning inclusive practice, use of inclusive language; (2) an overview of Autism, including addressing myths and facts, the different ways in which individuals with Autism experience the world, theories, diagnosis, prevalence, learning from individuals with Autism, sensory issues; (3) assessment of Autistic pupils in an educational setting; and (4) teaching strategies for pupils with Autism, at class (e.g. cultivating a positive atmosphere, use of visual supports, understanding child's behaviour, adapting the environment, addressing sensory issues) and whole school levels through carrying out audit and developing policy. A range of teaching approaches were employed by the trainers including PowerPoint slides, quizzes, video clips (e.g. individuals with autism speaking about their experiences), and presentations by current and former high school students with autism. The content and mode of delivery of the training were adapted to each sector to ensure relevance.

The head of each establishment decided who should participate in the training. Each establishment involved in the training programme was required to send at least one decision maker on the training which aligns with implementation science principles (Fixsen et al., 2005).

Measures

Two measures were employed pre and post intervention: Sentiments, Attitudes, and Concerns about Inclusive Education Revised Scale (SACIE-R) (Forlin et al., 2011); and Teacher Efficacy for Inclusive Practices (TEIP) (Sharma et al., 2012). In addition, a Questionnaire on Knowledge of Strategies/Understanding of Needs was completed post-intervention. Pre intervention measures were completed before the training and post intervention measures were administered after the training, ranging from five days to five weeks depending on school holidays and teachers' schedules.

Sentiments, Attitudes, and Concerns about Inclusive Education Revised Scale

The 15 item Sentiments, Attitudes, and Concerns about Inclusive Education Revised Scale (SACIE-R) (Forlin et al., 2011) has three subscales, each with 5 items, which measure sentiments, attitudes and concerns. The overall scale has good internal reliability (Cronbach's $\alpha=.74$). The subscales of sentiments, attitudes and concerns have internal reliability scores of $\alpha=.75$, $\alpha=.67$, $\alpha=.65$ respectfully. The scale contains a forced choice, Likert 4-point scale. When completing the scale, participants were asked to consider pupils with Autism.

Teacher Efficacy for Inclusive Practices

The 18 item Teacher Efficacy for Inclusive Practices (TEIP) scale was developed to measure teachers' perceived efficacy to teach in inclusive classrooms (Sharma et al., 2012) and comprises three factors: efficacy to use inclusive instructions, efficacy in collaboration, and efficacy in managing behaviour. The scale utilises a forced choice, Likert 6-point scale with 1=strongly disagree, 2=disagree, 3=disagree somewhat, 4=agree somewhat, 5=agree, 6=strongly agree. The scale has good internal reliability (Cronbach's $\alpha=.89$). The three factors of efficacy to use inclusive instructions, efficacy in collaboration and efficacy in managing behaviour have internal reliability of $\alpha=.93$, $\alpha=.85$, $\alpha=.85$ respectfully. During the development of the scale it was decided that items based on a specific label would not be included as the authors suggested that strategies that work with all students are required when teaching children of various abilities in the mainstream class (Sharma et al. 2012). However, Sharma et al. (2012) suggest that when measuring a teacher's efficacy in relation to pupils with a specific support need, for example Autism, the teacher can be instructed to think about the needs of a specific pupil when completing the scale. Thus, when completing the scale, participants were asked to consider pupils with Autism in their establishment as teacher efficacy is context and task specific (Bandura, 1997; Sharma et al., 2012; Wyatt, 2014).

Questionnaire on Usefulness of Training, Application of Knowledge, Effectiveness of Strategies (Appendix 1)

This questionnaire was developed to address aim 3, namely perceptions of the usefulness of training, application of knowledge and the effectiveness of strategies.

The first author explained the purpose of the questionnaire to participants and emphasised the focus was on changes in their practice since receiving the training. All 35 participants completed the questionnaire one month after the final training session.

The questionnaire was developed by the first author and revised following feedback on the content and format by five members of COS and an educational psychologist from the LA. It employed a mixture of open-ended (n=6) and closed questions (n=2). The closed questions used a 1-10 rating scale and assessed the perceived effectiveness of the strategies; and confidence in supporting a child with Autism in the class/educational establishment.

Data Analysis

The Wilcoxon signed-rank test was used to compare participants' pre and post intervention scores on the SACIE-R and TEIP. Non-parametric statistics were employed as the data were ordinal and there was a relatively small sample size (Coolican, 2009).

Qualitative data from questions 1, 2 and 4 in the Questionnaire on *Usefulness of Training, Application of Knowledge and Effectiveness of Strategies* were analysed using thematic analysis (Braun and Clarke, 2006). The themes were identified using a deductive approach and at a semantic level (Braun and Clarke, 2006). Descriptive statistics were employed for the 2 closed questions (q3 and q8). The data from questions 5, 6 and 7 are not reported for the purposes of this paper.

Results

Staff attitudes, sentiments and concerns to supporting pupils with Autism

There was a significant difference in total scores post training ($Z = -3.945$, $p = 0.000$, $p < 0.05$; with a medium effect size $r = 0.47$) (Field, 2007). This indicates that educators had fewer concerns and more positive sentiments and attitudes towards supporting pupils with Autism in the mainstream class/school. Looking at the three subscales, there was a significant difference in scores on the concerns subscale post training indicating participants had fewer concerns ($Z = -3.685$, $p = 0.000$, $p < 0.05$; with a medium effect size of $r = 0.44$). There was a significant difference in scores on the sentiments subscale post training, indicating that participants had more positive sentiments ($Z = -2.763$, $p = 0.006$, $p < 0.05$; with a medium effect size $r = 0.33$). There was no significant difference between pre and post-test scores on the attitude subscale ($Z = -1.106$, $p = 2.69$, $p > 0.05$; with a small effect size $r = 0.13$).

Whilst acknowledging the small sample sizes, which would impact on the power of the statistical analysis, findings revealed some differences between the three sectors. There were significant differences in early years educators' total scores post training ($Z = -3.109$, $p = 0.002$, $p < 0.05$; with a large effect size $r = 0.53$); concerns subscale scores post training ($Z = -2.807$, $p = 0.005$, $p < 0.05$; with a medium effect size $r = 0.48$), indicating that participants had fewer concerns; and sentiments subscale scores post training ($Z = -2.949$, $p = 0.003$, $p < 0.05$; with a large effect size $r = 0.51$), indicating that participants had more positive sentiments. In contrast, a significant difference was not found in the attitude subscale ($Z = -0.288$, $p = 0.773$, $p > 0.05$; with a small effect size $r = 0.05$).

There were significant differences in primary teachers' total scores post training ($Z = -2.032$, $p = 0.042$, $p < 0.05$; with a large effect size $r = 0.64$); and concerns subscale scores post training ($Z = -2.032$, $p = 0.042$, $p < 0.05$; with a large effect size $r = 0.64$), indicating that participants had fewer concerns. In contrast, there were no significant differences in sentiments subscale scores post training ($Z = -1.841$, $p = 0.066$, $p > 0.05$; with a large effect size $r = 0.58$); and in attitudes subscale scores post training ($Z = -1.134$, $p = 0.257$, $p > 0.05$; with a medium effect size $r = 0.36$).

There was no significant difference in secondary teachers' and other staff's total scores post training ($Z = -1.124$, $p = 0.261$, $p > 0.05$; with a small effect size $r = 0.22$). The differences in scores on the three subscales were also not significant.

INSERT TABLE 2 HERE

Staff efficacy in supporting pupils with Autism

Across the entire sample, there was a significant difference in teachers' and other school staff's efficacy in supporting pupils with Autism in the mainstream class/school post training ($Z = -3.406$, $p = 0.001$, $p < 0.05$, with a medium effect size $r = 0.41$). This indicated that participants had higher levels of efficacy for inclusive practice post training.

Looking at the three sectors, there was a significant difference in early years educators' efficacy scores post training ($Z = -2.772$, $p = 0.006$, $p < 0.05$; with a medium effect size $r = 0.48$) and primary teachers' efficacy scores ($Z = -2.023$, $p = 0.043$, $p < 0.05$; with a large effect size $r = 0.64$) indicating higher levels of efficacy for inclusive practice post intervention. In contrast, there was no significant difference in the secondary school staff's scores ($Z = -0.630$, $p = 0.529$, $p > 0.05$; with a medium effect size $r = 0.48$).

INSERT TABLE 3 HERE

Usefulness of Training, Application of Knowledge, Effectiveness of Strategies

INSERT TABLE 4 HERE

Table 4 details findings from the post training questionnaire; including ratings of effectiveness of strategies and confidence in supporting a child with Autism in the mainstream class/school. It also reports thematically on strategies that participants state they are utilising in the learning environment post training and useful aspects of the training.

Discussion

The aims of the study are set out in the sub-section 'Teacher efficacy in teaching pupils with Autism'.

Focusing on the first aim, there was some evidence of change in staff's SACIE-R total scores when the three sectors were combined. There was a significant change in the total scores of nursery and primary participants but no significant difference in the total scores of secondary participants. This aligns with previous research which indicates that teachers' attitudes are influenced by the school stage taught (Avramidis and Norwich, 2002); and as school age increases teachers' attitudes towards inclusive education get more negative (Rakap et al., 2010). A possible explanation is that teachers at upper stages of education, focus more on subject matter (Avramidis et al., 2002; Salvia and Munson, 1986).

Analysis of subscale scores revealed there was no significant difference in the attitudes subscale in any of the sectors following training. This contrasts with previous research that has found that fewer concerns about inclusive education correlate with more positive attitudes (Changpinit et al., 2007); and that training is likely to have a positive influence on teachers' attitudes (Avramidis and Norwich, 2002; Ben-Pajooh, 1992; Forlin, Loreman, and Sharma 2014; Sharma et al., 2008;

Shimman, 1990). However, with the exception of Forlin et al. (2014), these studies did not use the SACIE-R scale. Forlin, Loreman, and Sharma (2014), employing a large sample size (n=2361), found a small but positive impact on teachers' attitudes post training. In contrast, the present study had a much smaller sample size.

Several authors have linked teachers' sentiments and concerns to teachers' attitudes towards the inclusion of pupils with ASN (Forlin et al., 2011; Sharma et al., 2008; Sharma et al., 2006). This study found significant differences in the concerns subscale scores post training. This is in line with Forlin, Loreman and Sharma (2014) who report fewer concerns about inclusive education. In terms of differences between sectors, nursery and primary participants had significantly fewer concerns post training, whereas there was no significant difference in the secondary sector. Post training, there was a significant difference on the sentiments subscale overall. In terms of the differences between sectors, there was a significant difference in sentiments in the early years but not in the primary or secondary sectors. The areas of sentiments and concerns are worthy of future research, particularly in relation to differences between sectors.

Looking at the second area of enquiry, across the overall sample there was a significant improvement in participants' efficacy, as measured by TEIP, in supporting pupils with Autism post training. This concurs with previous studies in Hong Kong which found that teacher efficacy can be improved by training (Forlin, Loreman and Sharma, 2014; Forlin, Sharma and Loreman, 2014). However, comparing the three sectors, the change in the secondary participants was not significant. There does not appear to be previous research focusing on this area. This indicates another area for future research.

Focusing on the third area of enquiry, in the post-questionnaire, confidence levels in supporting a pupil with Autism in the mainstream class/school in the nursery, primary and secondary sectors achieved median scores of 9, 8 and 8 respectively. This is an important finding as previous studies have found a positive relationship between confidence and teacher efficacy in teaching pupils with Autism (e.g. Lo et al., 2014). In all sectors participants advocated the use of strategies that are recommended by NAS (2014). It can be concluded from this that training has had a positive impact on participants' espoused practice, although it is acknowledged that participants' practice was not observed by the researchers.

The present study has a number of limitations. As there was slightly different training in the sectors to accommodate the different contexts, it could be argued that it was not appropriate to combine the findings from the sectors or to conduct comparative analyses. However, as the majority of previous research has not investigated sector differences, the present study's initial findings are worthy of further investigation. Participants and establishments were purposively selected based on the establishments' needs. A random sampling method might have increased the internal and external validity of the research. Reliance on the Head Teacher to select participants may have had an impact on results depending on participants' motivation. The Questionnaire on Knowledge of Strategies/Understanding of Needs was only used post-intervention so there is no pre-intervention comparison. Post-intervention measures (SACIE-R and TEIP) were employed at different times, which would have impacted on the comparability of the findings. The small sample size

would have impacted on the power of statistical analysis and limited the range of views.

A number of areas merit future research:

- Participants had previous experience of working with children with Autism. It would be interesting to include participants without previous experience of working with children with Autism and compare and contrast the impact of training.
- More research is needed investigating difference between different sectors, particularly in relation to inclusive practice in the secondary sector.
- Further research is required focusing on sentiments and concerns about inclusive practice.
- Future research could incorporate follow up measures.

Based on participants' feedback on the perceived value of the training, there are a number of areas that should be incorporated into future training on Autism for school staff. These would enhance staff self-efficacy and create a more inclusive educational experience:

- Understanding the needs of children with autism through an appreciation of the different ways in which they experience the world. This should include theoretical perspectives.
- Learning a range of pedagogical strategies to support children with Autism. This could include, but limited to, cultivating a positive classroom ethos, understanding the child's behaviour before intervening, and methods of enhancing predictability such as visual supports.
- Understanding the impact of sensory issues and how to adapt the class and school environments to make them more inclusive. This relates to the concept of universal design negating the need for specialized adaptations.
- Experiential learning through hearing the personal experiences of individuals with Autism through literature, videos and direct personal accounts.
- Opportunities for professional dialogue with colleagues. This could be with colleagues in the same school; networking with staff in other establishments; and support from specialist staff.

Future training may wish to place greater emphasis on practical elements such as mastery components (coaching in context) and vicarious experience (observation of practice).

References

- Agbenyega, J. 2007. "Examining teachers' concerns and attitudes to inclusive education in Ghana." *International Journal of whole schooling* 3 (1): 41-56.
- Avramidis, E., P. Bayliss, and R. Burden. 2000. "A survey into mainstream teachers' attitudes towards the inclusion of children with special educational needs in the ordinary school in one local education authority." *Educational Psychology* 20 (2):191-2.
- Avramidis, E., and B. Norwich. 2002. "Teachers' attitudes towards integration/inclusion: A review of the literature." *European Journal of Special Needs Education* 17 (2):129-147.
- Bandura, A. 1986. *Social foundations of thought and action*. NJ: Prentice Hall.
- Bandura, A. 1997. "Insights. Self-efficacy." *Harvard Mental Health Letter*, 13 (9): 4-6.
- Baron-Cohen, S. 2008. *Autism and Asperger syndrome*. Oxford: Oxford University Press.
- Beh-Pajooh, A. 1992. "The effect of social contact on college teachers' attitudes toward students with severe mental handicaps and their educational integration." *European Journal of Special Needs Education*, 7 (2): 87-103.
- Bešić, E., Paleczek, L., Krammer, M. and Gasteiger-Klicpera, B., 2017. "Inclusive practices at the teacher and class level: the experts' view." *European Journal of Special Needs Education*, 32(3), 329-345.
- Boyle, C., Topping, K. and Jindal-Snape, D., 2013. "Teachers' attitudes towards inclusion in high schools." *Teachers and Teaching*, 19(5): 527-542.
- Braun, V., and V. Clarke. 2006. "Using thematic analysis in psychology." *Qualitative research in psychology* 3 (2):77-101.
- Changpinit, S., D. Greaves, and Frydenberg, E. 2007. "Attitudes, knowledge, concerns, and coping strategies regarding inclusive education in a community of Thai educators." In *1st International Conference on Educational Reform, Mahasarakham University, Thailand*.
- Coolican, H. 2009. *Research Methods and Statistics in Psychology*. 5th ed. Oxon: Routledge.
- Corsini, R. J. 1999. *The Dictionary of Psychology*. Oxon: Psychology Press.
- Emam, M. M. 2014. "The Closeness of Fit: Towards an Ecomap for the Inclusion of Pupils with ASD in Mainstream Schools." *International Education Studies* 7 (3): 112-125.

Emam, M. M., and Farrell, P. 2009. "Tensions experienced by teachers and their views of support for pupils with autism spectrum disorders in mainstream schools." *European Journal of Special Needs Education* 24 (4): 407-422.

Field, A. 2007. *Discovering Statistics using SPSS*. 3rd ed. London: Sage.

Fixsen, D. L., Naoom, S.F., Blase, K.A., Friedman, R.M., and Wallace. F. 2005. "Implementation research: A synthesis of the literature Tampa FL University of South Florida, Louis de la Parte Florida Mental Health Institute." *The National Implementation Research Network (FMHI Publication# 231)* 11:247-266.

Foreman, P. J. 2001. *Integration and Inclusion in action*. New South Wales: Harcourt Brace & Company.

Forlin, C., Earle, C., Loreman, T., and Sharma, U. 2011. "The Sentiments, Attitudes, and Concerns about Inclusive Education Revised (SACIE-R) Scale for measuring pre-service teachers' perceptions about inclusion." *Exceptionality Education International* 21 (3): 50- 65.

Forlin, C., Loreman, T. and Sharma. U. 2014. "A system-wide professional learning approach about inclusion for teachers in Hong Kong." *Asia-Pacific Journal of Teacher Education* 42 (3): 247-260.

Forlin, C., Loreman, T., Sharma, U., and Earle. C. 2009. "Demographic differences in changing pre-service teachers' attitudes, sentiments and concerns about inclusive education." *International Journal of Inclusive Education*, 13(2): 195-209.

Forlin, C., Sharma, U., and Loreman. T. 2014. "Predictors of improved teaching efficacy following basic training for inclusion in Hong Kong." *International Journal of Inclusive Education* 18 (7): 718-730.

Galaterou, J., and Antoniou, A. S. 2017. "Teachers' Attitudes towards Inclusive Education: The Role of Job Stressors and Demographic Parameters." *International Journal of Special Education* 32 (4): 643-658.

LO, S.K., LI, P.Y.E., JI, M., LAI, T.T., WONG, W.K., SO, W.M.W. and SIN, K.F.K., 2014. "Teachers' perspective on teaching students with Autism Spectrum Disorders in non-English-speaking inclusive education setting." International Conference on Education, Economics and Humanities, Kuala Lumpur.

McGillicuddy, S., and O'Donnell. G.M. 2014. "Teaching students with autism spectrum disorder in mainstream post-primary schools in the Republic of Ireland." *International Journal of Inclusive Education* 8(4):323-344.

McGregor, E., and Campbell. E. 2001. "The attitudes of teachers in Scotland to the integration of children with autism into mainstream schools." *Autism* 5(2):189-207.

National Autistic Society. 2014. *Classroom and playground: support for children with autistic spectrum disorders*. Retrieved from { HYPERLINK "http://www.autism.org.uk/working-with/education/educational-professionals-in-

[schools/lessons-and-breaktimes/education-classroom-and-playground-support-for-children-with-autism-spectrum-disorders.aspx" }](#)

National Autistic Society. nd. Retrieved from <https://www.autism.org.uk/about/what-is/myths-facts-stats.aspx>.

Nowicki, E. A., and Sandieson, R. 2002. "A meta-analysis of school-age children's attitudes towards persons with physical or intellectual disabilities." *International Journal of Disability, Development and Education* 49 (3): 243-265.

Rakap, S., and Kaczmarek, L. 2010. "Teachers' attitudes towards inclusion in Turkey." *European Journal of Special Needs Education* 25 (1): 59-75.

Round, P. N., Subban, P. K., and Sharma, U. 2016. "I don't have time to be this busy.'Exploring the concerns of secondary school teachers towards inclusive education." *International Journal of Inclusive Education*, 20(2), 185-198.

Salvia, J., and Munson, S. 1986. "Attitudes of regular education teachers toward mainstreaming mildly handicapped students." *Mainstreaming handicapped children: outcomes, controversies and new directions* 111-128.

Scottish Government. 2017. *Summary statistics for schools in Scotland*. Retrieved from <https://www.gov.scot/Publications/2017/12/3099>

Sharma, U., Forlin, C., and Loreman, T. 2008. "Impact of training on pre- service teachers' attitudes and concerns about inclusive education and sentiments about persons with disabilities." *Disability & Society* 23 (7): 773-785.

Sharma, U., Forlin, C., Loreman, T., and Earle, C. 2006. "Pre-service teachers' attitudes, concerns and sentiments about inclusive education: An international comparison of novice pre-service teachers." *International Journal of Special Education* 21(2): 80-93.

Sharma, U. Loreman, T., and Forlin. C. 2012. "Measuring teacher efficacy to implement inclusive practices." *Journal of Research in Special Educational Needs* 12 (1): 12-21.

Shimman, P. 1990. "The impact of special needs students at a further education college: A report on a questionnaire survey." *Journal of Further and Higher Education* 14 (3): 83-91.

Tschannen-Moran, M., Hoy, A.W. and Hoy, W.K., 1998. "Teacher efficacy: Its meaning and measure." *Review of Educational Research* 68(2): 202-248.

UNESCO. 1994. *The Salamanca Statement and Framework for Action on Special Needs Education*. Retrieved from { HYPERLINK "http://www.unesco.org/education/pdf/SALAMA_E.PDF" }

UN (United Nations). 2006. *Convention on the rights of persons with disabilities*. Retrieved from { HYPERLINK

"<http://www.un.org/disabilities/convention/conventionfull.shtml>" }

Wyatt, M. 2014. "Towards a re-conceptualization of teachers' self-efficacy beliefs: tackling enduring problems with the quantitative research and moving on." *International Journal of Research & Method in Education* 37 (2): 166-189.

Table 1 Participants in Training

Sector	No of Establishments	No of participants	No of early years educators or teachers	No of support staff	No of clerical staff	No completing measures
Nursery	3	17 (10+3+4)	17	0	0	17
Primary	1	6	6	0	0	5
Secondary	1	14	10	3	1	13

Table 2 – SCAIE-R

Sector	Z Score	p Values	Effect Size r
Nursery			
Total	3.109	0.002*	0.53
Sentiments	-2.949	0.003*	0.51
Concerns	-2.807	0.005*	0.48
Attitudes	-0.288	0.773	0.05
Primary			
Total	-2.032	0.042*	0.64
Sentiments	-1.841	0.066	0.58
Concerns	-2.032	0.042*	0.64
Attitudes	-1.134	0.257	0.36
Secondary			
Total	-1.124	0.261	0.22
Sentiments	-0.181	0.856	0.04
Concerns	-1.268	0.205	0.25
Attitudes	-0.759	0.442	0.15
All Sectors			
Total	-3.945	0.000*	0.47
Sentiments	-2.763	0.006*	0.33
Concerns	-3.685	0.000*	0.44
Attitudes	-1.106	2.69	0.13

*=Significant at 0.05

Table 3 – TEIP

Sector	Z Score	p Values	Effect Size r
Nursery	-2.772	0.006*	0.48
Primary	-2.023	0.043*	0.64
Secondary	-0.630	0.529	0.48
Total sample	3.406	0.001*	0.41

*=Significant at 0.05

Table 4 – Post training questionnaire

Sector	Strategies	Effectiveness of strategies ¹	Useful aspects of training	Confidence in support pupils with ASD ²
Nursery	<p>Use of visual aids</p> <p>Careful use of language</p> <p>Allowing children time to process instructions</p> <p>Giving short instructions</p> <p>Having a good speech model in place</p> <p>Preparing children in advance for change</p> <p>Consistency of approach</p> <p>Sharing good practice</p>	<p>Range - 5 to 10</p> <p>Median - 8</p>	<p>Learning about needs and how to meet them</p> <p>Listening to young people with ASD speak about their experiences</p>	<p>Range - 8 to 10</p> <p>Median - 9</p>
Primary	<p>Use of visual aids</p> <p>Extra support from peers or professionals</p> <p>More understanding of ASD and associated needs</p>	<p>Ranged - 6 to 9</p> <p>Median - 8</p>	<p>Gaining an understanding of ASD and associated needs</p> <p>Hearing about how having a communication disorder affects individuals from their own</p>	<p>Range - 6 to 9</p> <p>Median - 8</p>

¹ Scale of 1 to 10, with 1 being not effective and 10 being very effective.

² Scale of 1 to 10, with 1 being not at all confident and 10 being very confident.

Sector	Strategies	Effectiveness of strategies ¹	Useful aspects of training	Confidence in support pupils with ASD ²
	<p>Appropriate target setting</p> <p>Extra support from the teacher or pupil support assistant</p> <p>Peer support from 'reading buddies'</p> <p>Using clear communication</p> <p>Allowing children extra time to process instructions</p> <p>Preparing children in advance for change</p>		<p>perspective Learning about strategies that can be used to support individuals with language and communication difficulties</p> <p>Learning about how the environment can impact the child</p>	
Secondary	<p>Careful use of language</p> <p>Building a relationship with the pupil in order to know them well</p> <p>Informing pupils of changes in advance</p> <p>Provision of support from the teacher</p> <p>Pupil support assistant, outreach team</p>	<p>Range - 6 to 9</p> <p>Median - 7</p>	<p>Learning about ASD</p> <p>Learning about strategies that can be used to support children with communication and language difficulties</p> <p>Listening to the experiences of young people with ASD</p> <p>Time for professional dialogue with colleagues</p>	<p>Range - 5 to 10</p> <p>Median - 8</p>

Sector	Strategies	Effectiveness of strategies ¹	Useful aspects of training	Confidence in support pupils with ASD ²
	Peer support from 'senior guiders'			