In need of review: Developing Sensory Provision in Northern Ireland's Mainstream Primary classrooms

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The impact of Sensory Processing Difficulties across a range of Special Educational Needs is well researched. More recently, the impact on children's mental health and well-being, linked with anxiety, depression and self-injurious behaviours, have redirected international research to consider the holistic benefits of sensory provision, for those with special educational provision and the wider classroom population. A SMART SURVEY was designed to collate empirical evidence regarding current sensory awareness and provision in mainstream primary schools throughout Northern Ireland, in a time efficient manner. Out of 809 schools, 164 (20.27%) fully completed the online survey. Findings indicate that Special Educational Needs Coordinator confidence in developing practice, supporting staff and children was limited and impaired by insufficient and inconsistent training opportunities. While healthcare research recommends provision by trained professionals, Occupational Therapy input was limited (n = 34; 24.8%), resulting in practice that could be detrimental rather than beneficial to children's progress. Respondents identified a need for sensory training for teachers (n = 124; 93.94%) to ensure that the impact of Sensory Processing Difficulties on the holistic development of all children is understood. Pupil voice was undervalued (n = 5; 3.6%). Active involvement of children in the process of evaluation and intervention is recommended to enhance pupil autonomy and well-being.

Background

Since the seminal work of Ayres (1969), the ability of individuals to process sensory information and modulate their own responses to the information received has become the focus for a new field of research and the development of diagnostic tools (Ayres, 1989; Dunn, 1999, 2014). In addition to motor and movement-related difficulties associated with occupational therapy, Ayres proposed that sensory 'integration' difficulties would impact a child's ability to concentrate, organise all sensory information, reason and think in the abstract, impacting cognition and learning (Ayres, 1972b). Additionally, she considered the effects of poor modulation of sensory responses on the development of an individual's self-esteem, self-control, self-confidence and social development (1969; 1971). Sensory Processing Disorder (SPD) has since received diagnostic criteria (Miller et al, 2005; PDM Task Force, 2006; Zero to Three, 2005) and inclusion in the DSM-V as a sub-set criterion in the diagnosis of Autistic Spectrum Disorder (ASD) (APA, 2013). This status has influenced many studies which link SPD with Special Education Needs and Disabilities (SEND) provision: *ASD* (Miguel et al., 2017; Tavassoli et al., 2018; Thye et al., 2018); *Attention Deficit and Hyperactivity Disorder* (ADHD) (Ghanizadeh, 2013; Shimizu et al., 2014; Jung et al, 2014); *Motor difficulties* (Allen and Casey, 2017; Gomez and Sirigu, 2015; Shafer et al. 2017; Siaperas et al, 2014); *Speech and Language difficulties* (Treille et al, 2017); *Tourette's Syndrome (*Jewers et al., 2013*)* and *Down's Syndrome* (van Jaarsveld et al., 2016). Further research has considered the effects upon *intelligence* and *academic performance* in the core curricular areas (Anguera et al, 2017; Zentall et al, 2013) and identified correlation between SPD and *Self Injurious Behaviours* (Gomez and Sirigu, 2015; Summer et al., 2017), *anxiety* (McDonnell et al, 2015), *depression* (Serafini et al, 2017) and *attachment disorders* (Meredith et al, 2016). The consequential links between occupational therapy and educational practice have resulted in OT sensory assessments, interventions and resources becoming commonplace in Special Educational Needs (SEN) schools, but less so in the mainstream setting.

Sensory provision and education

The drive for inclusivity in education (UNICEF, 1989; UNESCO, 1994; Booth et al., 2000; UNESCO, 2015; HMSO, 2016) has affected numbers of children with an SEN statement in mainstream schools, with acknowledgement that this trend will continue (Donnelly, 2017). In 2018/19, 70% of children with a statement of SEN in

Northern Ireland were taught in a mainstream setting (DENI, 2019), and in England, the average percentage of children on Education Health Care plans[1] placed in the mainstream setting was 98.62%. Consequently, Special Educational Needs provision is no longer the remit of specialist teachers but the role of all teaching and non-teaching staff. While addressing children's sensory processing needs may not have been a consideration in the past, an increasing awareness of the links between ASD and SPD (APA, 2013), accompanied by a rise in numbers of children with autism in the NI school population, from 1.2% to 3.3% in the past 10 years (Waugh, 2019), appears to have created a need for teacher training in this area. This reflects international statistics (CDC, 2020) and, although this rise can be attributed in part to improved assessment and rates of early diagnosis (Doheny, 2008; Rice et al (2012, p. 12) argue that 'a true increase cannot be ruled out'. This being the case, it is unsurprising that the use of multi-sensory rooms, resources and strategies in the special school sector appears to be on the rise, and the use of 'sensory toys' to provide for children who present with 'inappropriate sensory responses' within the daily routine of the mainstream classroom is a more frequently observed feature (ETI, 2019). Although, in special schools, multi-sensory room use and the allocation of sensory equipment are often based upon the advice of occupational therapists (OTs) (Mielnick, 2017), the parallel rise of similar resources in mainstream schools can be undertaken without such advice and without any underlying understanding of sensory processing difficulties. While OT informed school-based sensory integration programmes exist in a minority of mainstream settings in Northern Ireland, the 'monitoring of pupil progress' in this area is mostly overseen by trained classroom assistants rather than by teaching staff (Education Training Inspectorate (ETI), 2019, p. 5). Some professional and semi-professional resources (Middletown Centre for Autism (MCA), 2018; McNally, Morris and McAllister, 2013; Department of Health, 2011; Wilkes, n.d.) are accessible to practitioners, and training and support are available from local organisations, such as the Regional Integrated Support for Education in Northern Ireland (RISE NI) and MCA. Despite the links with SPD and a range of SEND, occupational therapy input is often accessed and/or funded by individual schools to support specific children and these sensory resources and support services often remain ASD specific. Consequently, school communities, teachers, classroom assistants and parents may be unaware of the range of co-occurring difficulties related to SPD and the ways in which children can be supported in overcoming their difficulties. In a recent systematic review of sensory provision, Miller-Kuhaneck and Watling (2018) recognise the increasing demands on carers at home and on teachers in the school environment as they seek to meet the needs of children with sensory processing difficulties; a particular issue if the sensory issues needing to be addressed are not fully understood and resources and strategies unavailable or ineffectively used.

Purpose of study

From a healthcare perspective, for sensory provision in the classroom to be effective would require more than the use of supplementary resources and strategies (Dean, Little, Tomchek and Dunn, 2018; Miller-Kuhaneck and Watling, 2018). Rather, it would involve sensory-informed practitioners informing children as part of a daily, individually directed process (Dean et al, 2018). This requires a higher level of teacher engagement and the development of a shared sensory vocabulary (Pagliano, 2012) within the classroom. Shanker (2010; 2012) notes the value of teaching sensory self-regulation skills to children, arguing that pupils should be taught these, on a daily basis, for daily independent use, increasing what CCEA (2007, p. 2) term their capacity for 'self-management and taking responsibility' for their responses and behaviours.

As the first phase in a PhD study, this research sought to collate empirical evidence to ascertain current levels of sensory provision in NI mainstream primary schools and if this provision is sufficiently informed to be fully effective. This paper reports the results of Phase 1 which sought to ascertain:

1. What is the current availability of sensory resources and the range of sensory strategies in use in NI schools?
2. Which children do SENCOs/LSCs feel require sensory provision?
3. How effective do they feel the use of sensory resources in a mainstream setting would be?
4. What sources and levels of advice and training are currently available to teachers?
5. What are the levels of Special Educational Need Coordinator (SENCO)/Learning Support Coordinator (LSC) confidence in supporting staff and parents in the use of sensory resources and strategies?

It should be noted that participant response rate, if not impacted by other influences, would also be a measure of awareness, knowledge and interest in the area.

METHODOLOGY

Creating the online survey

The use of an online survey was selected to provide a large sample of quantitative and qualitative data from a wide range of schools collated in a time efficient manner (Denscombe, 2010). In order to obtain a comprehensive overview of teachers' current understanding of sensory processing and modulation difficulties and current, 'representative' perspectives on good practice in Northern

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[1]EHC plans were introduced by the Children and Families Act 2014 and replaced 'statements of special educational needs'.

Ireland mainstream primary schools, probability sampling was used (Cohen, Manion and Morrison, 2011, p. 154). A large sample was chosen to improve the quality of the data; 'reducing bias and increasing significance' (Newby, 2010, p. 312). This allowed for the use of 'uneven scales' and the potential collation of 100% of SENCO/LSC opinion (ibid. p. 308). In addition, this research sought to identify a group of schools which would be suitable for the next phase of the research. Consequently, the 'technical design' of the survey allowed for the redirection of the schools who had not invested in sensory resources and would not be interested in doing so in the future (Cohen, Manion and Morrison, 2011, pp.276-288). The online survey included 22 questions. These related to: the demographic of the respondent group (Q1-3), current sensory resourcing, and strategies, questions (Q.4-8), levels and sources of sensory training (Q.9-12), identification and allocation of sensory resources and strategies (Q.13-15), perceived benefits of sensory resources and strategies (Q.16-18) and levels of SENCO/LSC confidence in supporting members of the school community in terms of sensory provision (Q 19-22).

While the use of SMART SURVEY allowed access to all mainstream primary schools and provided an efficient method of collecting data for analysis and interpretation, a higher 'non-response rate' was a risk (Denscombe, 2009, p. 282). Given the size of the sample, a closed questioning approach was chosen to enable comparisons to be made and verification of data across settings (Cohen et al. 2011; Cresswell, 2008; Newby, 2010). The questionnaire was designed to provide information regarding the 'costs' and benefits of sensory provision and could ascertain if respondents are making disinterested judgements or expressing personal interest or degrees of confidence. The use of scaling allowed for the measurement of attitude, giving a list of tick boxes allowed for speed of completion, randomly ordered to avoid weighting, and comment boxes captured options unknown to the researcher, and allowed for respondents' voices to be heard and a 'richer picture' of current levels of sensory awareness to be identified (Newby, 2010, p. 301). While time-consuming to process, some questions were purely qualitative; designed to gauge the respondents' knowledge and understanding of sensory need. Although accurate, factual recording of school practice was sought, it was noted that opinion or belief could influence responses and that this should be taken into account in the analysis of the data (ibid, p. 149).

Given that this study not only deals with educational but also healthcare terminologies, it was important to avoid complex language, abbreviations, jargon and to make questions relevant to the audience (Thomas, 2013). Questions were worded to avoid misinterpretation (Newby, 2010), unintentional bias and to avoid respondents feeling pressured to give certain responses or disinclined to give an opinion, reducing the usable data. A pilot survey sent to SENCOs/LSCs, Principals and Union representatives, was used to gauge the user-friendliness of the survey and the validity of the questions. The feedback highlighted technical issues in relation to the live content. SENCOs/LSCs also suggested changes in the SEN and Non-SEN grouping in relation to Department of Education changes to SEN and Medical registration terminology, particularly relating to the registration Social Emotional and Behavioural Difficulties (SEBD) to the new terminology, Social Emotional, Behavioural Well-Being Difficulties (SEBW) (DENI, 2019). They also requested encouragement was given in the introductory and permission sections to ensure that SENCOs/LSCs with less knowledge and understanding would feel that their contributions were still be valuable, as their experience and knowledge of school sensory resourcing and strategies, or lack of it, were essential to the process of creating an accurate record of current practice in mainstream primary classrooms.

Respondents
All primary schools in Northern Ireland were contacted (n = 809). As a result of GDPR restrictions, the survey was addressed to principals, as 'gatekeepers' or 'brokers' of access to school information and staff input (Denscombe, 2010; Saunders, Lewis and Thornhill, 2009, p. 170) and also to the SENCO/LSC, since sensory provision is often associated with SEN support. Within this email, an explanation of the purpose of the research was provided and the option to participate or decline given.

Ethical considerations
Since respondents were being asked to provide information on the current capabilities of staff and the resources available to them in their school communities, full disclosure and informed consent were essential alongside assurances that confidentiality and anonymity were guaranteed. The online survey was designed to protect this (Denscombe, 2010; Miller, 2012; Savin-Baden and Howell Major, 2013) so that no data could be traced. Respondents were informed of where and for how long data would be stored, how it would be used and by whom (Savin-Baden and Howell Major, 2013). NVivo 12 was used to safely store the results, with each school responses coded by anonymous ID, for comparison of results without identification of respondents.

RESULTS
All 809 schools received the email, and was completed by 164 respondents, resulting in a survey completion rate of 20.27% and reflecting the target population[2].

Q.1-3 Demographic of the respondent group

The respondents were mainly experienced teachers; 130 (80.7%) had been teaching for 16+ years. Eighty-eight

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[2](Calculations, based on a 95% confidence level and confidence interval level of 6.84%, indicate that a sample of 164 would be required to reflect the target population as precisely as needed. (http://www.surveysystem.com/sscalc.htm)

respondents (53.7%; Group A) had sensory resources in their school. Of the respondents who did not have sensory resources, 27 (16.4%) indicated that they would not purchase sensory resources if funding was available; however, 48 respondents (29.3%; Group B) identified a range of resourcing which they would purchase, if funding was available.

Q. 4-8 Current sensory resourcing, and strategies

The most common items noted by respondents in Group B were *fidget toys* (n = 14; 29.1%), *weighted items* (n = 14; 29.1%), *beanbags/large cushions* (n = 11; 22.9%), *classroom tents* (n = 11; 22.9%) and textured and tactile items (n = 9; 15; 18.75%)

Only four respondents (8.3%) would purchase equipment relating to the *auditory sense* and no equipment relating to the *olfactory or gustatory* senses was noted. Twenty-one schools (43.7%) would fund an allocated sensory room or space and two (4.1%) an outdoor sensory area. Of the non-specific equipment noted, *lighting equipment* (n = 17; 35.4%), *sensory boxes* (n = 3; 6.25%) and *stress toys* (n = 3; 6.25%) were the most popular.

Group A (n = 88; 53.7%) specified a wider range of resources currently available to them (Figure 1). The most common items noted by respondents in this group were *fidget toys* (n = 82; 93.2%), *sqeezeable* (n = 76; 86.4%) and *textured/ tactile* items (n = 71; 80.7%), *ear-defenders* (64; 72.7%), *weighted objects* (n = 46; 52.3%), *weighted blankets* (n = 34; 38.6%), *beanbags/large cushions* (n = 71; 80.7%) and *classroom tents* (n = 71; 80.7%). Thirty-two respondents had an allocated sensory room (36.34%) or a multi-purpose sensory room (n = 17; 19.32%)

Out of 12 additional responses, one commented on having 'little resources' and three had to make resources for themselves.

Having applied the exclusion criteria, respondents with current resources (n = 88; 53.7%) and those interested in purchasing resources (n = 49; 29.9%) were asked to complete the remainder of the survey (n = 137). Sensory strategies used varied across these schools: *movement breaks* (93.4%; *background sounds/music* (65.7%); *adjustments to lighting* (13.9%) and *deep pressure techniques* (42.4%). Of the additional strategies named by 50 (36.4%) respondents, seven (14%) were behavioural management strategies, seven (14%) related to Physical Education and 11 (22%) focussed on relaxation techniques.

Q. 9-12 Levels and sources of sensory training

When asked if teacher education/training in the use of sensory resources was necessary for teachers to plan and implement effective sensory support for children in mainstream schools, 124 respondents (90.5%) believed that it was. Availability of training to staff was inconsistent (Figure 2), with 38 schools (27.7%) having no training at all.

Thirteen schools (9.5%) noted that they had training for classroom assistants but in seven schools, only the classroom assistants had training (5.1%). In two schools, only parents had training (1.5%). Figure 3 charts the range of training providers.

Additional comments (n = 48) revealed that the source of training was also very inconsistent and an element of SEN support training rather than the specific focus. In 34 schools (24.8% of total respondents), specific OT training had been available, but in seven cases (5.1%), training was for classroom assistants rather than teaching staff. Training was often attached to individual children.

> *Any advice in terms of sensory training has only ever been provided for those individuals from their OT in the form of written suggestions of what we can do. In my opinion, this is not adequate training.*

Even with training, one SENCO discussed constraints on time,

> *I have disseminated info from courses to staff but I do not currently have time to individually support children with sensory needs.*

and budgets,

> *We have tried to improvise as there is no training and our budgets won't stretch it anyway.*

Of the forty-nine of all respondents who had a sensory space (n = 17; 12.4%) or room (n = 32; 23.4%), 36 respondents (26.2%) indicated that they had training specific to the use of sensory rooms and ten additional comments (7.3%) noted training from resource providers.

Q. 13-15 Identification of sensory need and allocation of sensory resources and strategies

Respondents suggested identification methods without survey prompts (Q.13). Some teachers were able to identify observable features relating to Dunn's Sensory Thresholds (1999, 2014). Sensory seeking (n = 12; 8.8%) and avoiding behaviours (n = 12; 8.8%) were the most familiar, while under-responsivity, in terms of clumsiness or lack of response to stimuli, was the least resourced (n = 6; 4.4%). Two respondents used the term 'sensory overload' and 10 (7.3%) noted poor emotional regulation as an indicator. Other indicators related to behavioural difficulties or named diagnoses; ASD being the most common. Parental observation was used by 32 respondents (23.4%). Advice from outside agencies was used by

Figure 1: (Q6a/7) Resources viewed as valuable by respondents schools

(Q6a/7) Resources viewed as valuable by respondents schools

- Group A - Schools with these resources
- Group B - Schools with no current resources
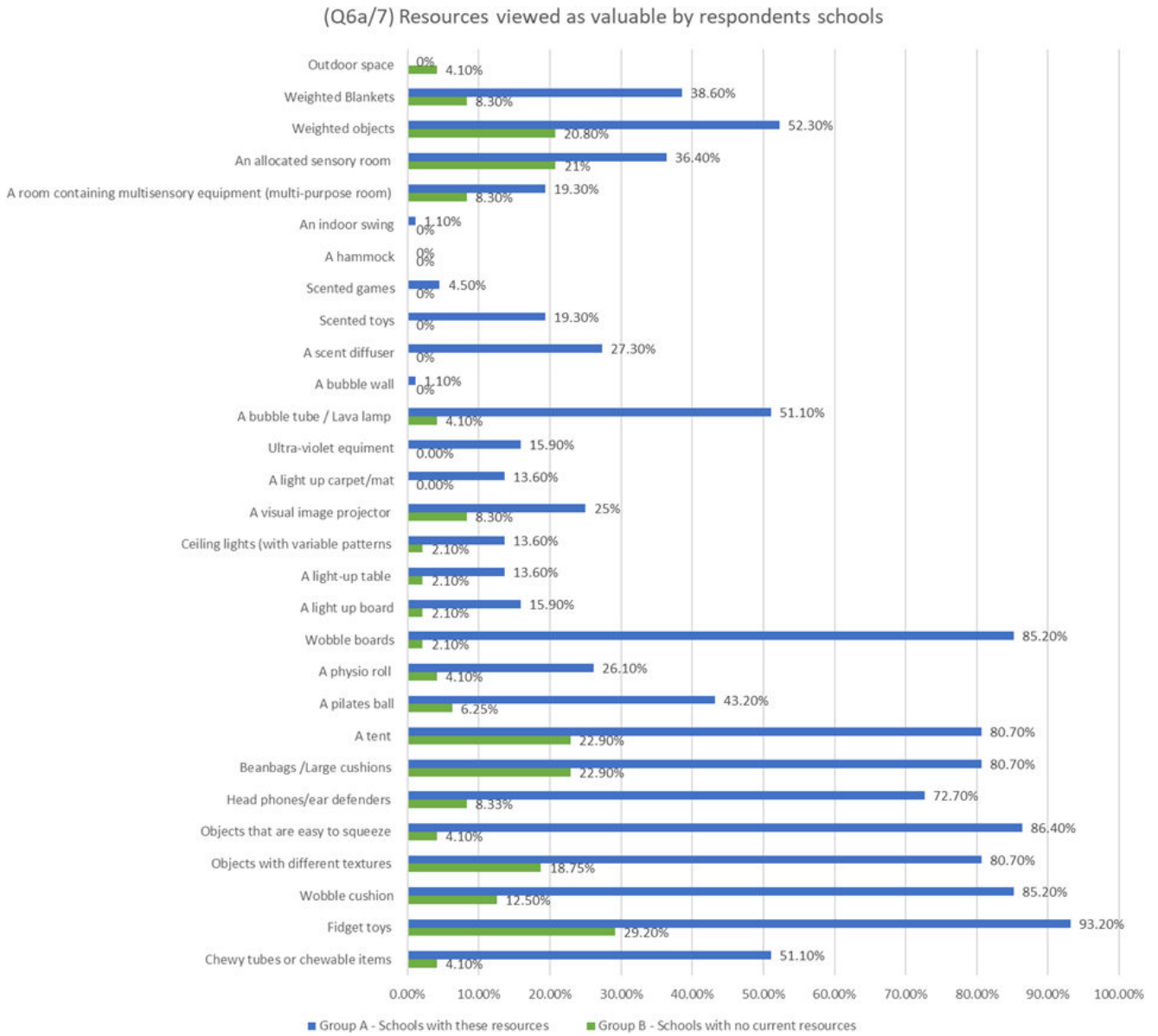
Figure 2: Q.10 Which members of your school community have had access to training in the use of sensory resources?

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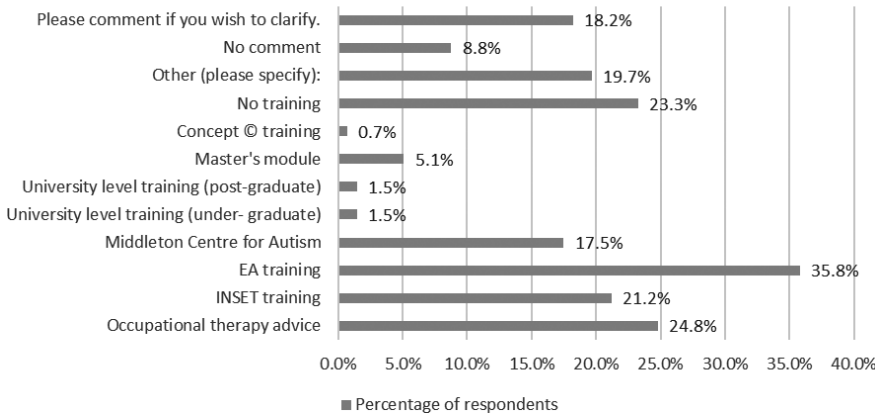
- Percentage of respondents
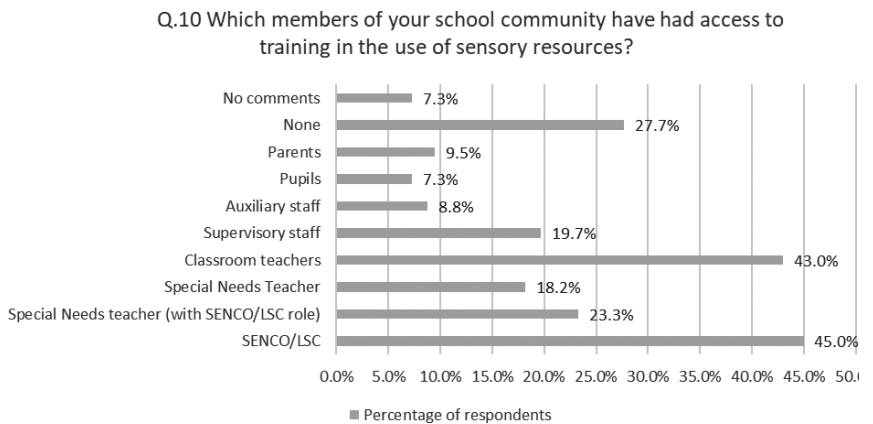
Q.11 Who provided the training?

13 (9.5%) respondents; occupational therapy was named specifically by 14(10.2%) respondents. Only 5 respondents (3.6%) identified by child report.

Question 14 sought to ascertain how resources were allocated (Figure 4).

Thirty respondents (21.9%) made important, clarifying comments. Ten were very informed, discussing how,

...pupils with sensory preferences are prioritised, depending on the relevant advice and the appropriate equipment allocated to them.

Others noted having very limited resources (n = 15), six of whom bought their own. One school used resources provided by a parent and one felt existing resources were being used ineffectively.

Question 15 sought to ascertain how strategies were agreed (Figure 5).

Of the additional comments made (n = 25; 18.2%), ten (7.3%) noted the importance of the school team rather than one individual taking responsibility for this role and
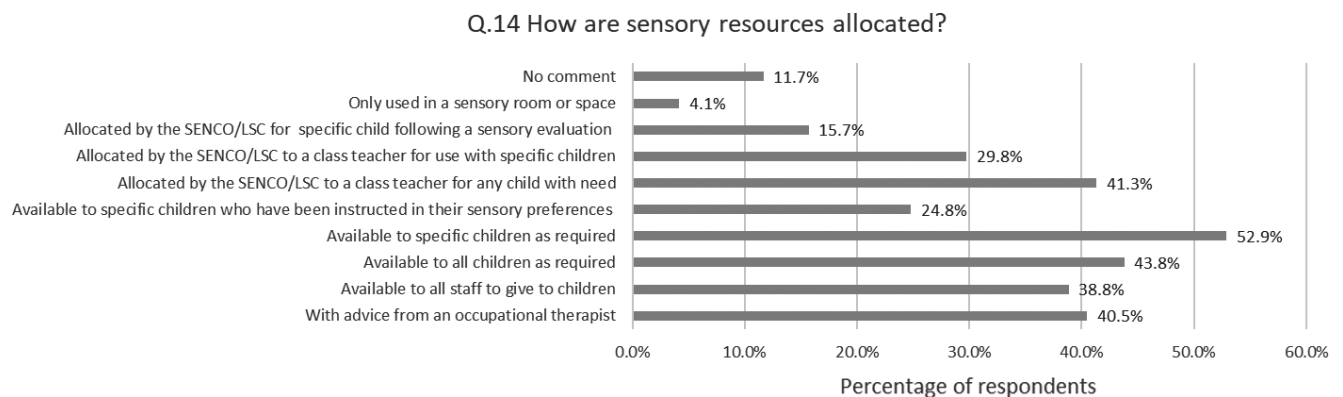
two (1.5%) noted the importance of parental involvement and permission. However, five (3.6%) made decisions alone and four (2.9%) indicated limited resourcing and training.

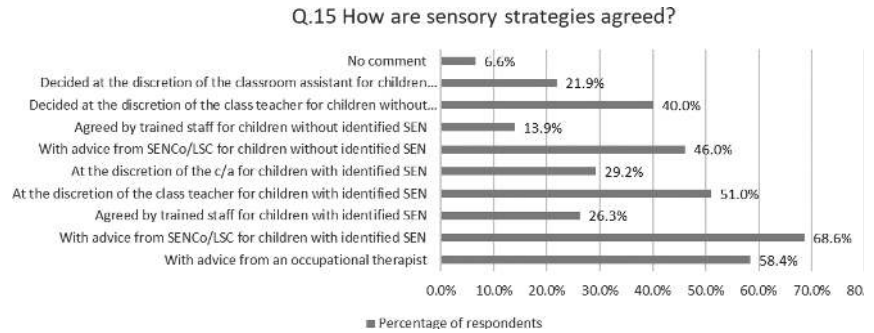*Q. 16-18 Perceived benefits of sensory resources and strategies*

Respondents were asked (Q.16) which children would benefit most from sensory provision. Children with ASD (n = 128; 93.4%), ADHD (n = 128; 93.4%), Emotional difficulties (n = 126; 92%) and Attachment Disorders (n = 114; 83.2%) were considered to be those who would benefit most from sensory provision. Dyspraxia was placed next in importance (n = 82; 59.9%). Least importance was given to children with Dyslexia (n = 64; 46.7%), Dyscalculia (n = 49; 35.8%) and Foetal Alcohol Syndrome (44.36%). While 79 respondents (57.7%) had indicated that sensory support was important at some level for children without identifiable SEN, only 28 (20.4%) felt it was very important for these children.

Respondents noted that the use of resources and strategies would have a wide range of benefits for children in the mainstream classroom. They agreed or strongly agreed

Figure 4: Q.14 How are sensory resources allocated?

Figure 5: Q.15 How are sensory strategies agreed?

Q.15 How are sensory strategies agreed?

Strategy	Percentage
No comment	6.6%
Decided at the discretion of the classroom assistant for children...	21.9%
Decided at the discretion of the class teacher for children without...	40.0%
Agreed by trained staff for children without identified SEN	13.9%
With advice from SENCo/LSC for children without identified SEN	46.0%
At the discretion of the c/a for children with identified SEN	29.2%
At the discretion of the class teacher for children with identified SEN	51.0%
Agreed by trained staff for children with identified SEN	26.3%
With advice from SENCo/LSC for children with identified SEN	68.6%
With advice from an occupational therapist	58.4%

■ Percentage of respondents

that children's behavioural responses (n = 124; 90.5%), self-awareness (n = 111; 81%), social interactions (n = 102; 74.5%), independence (n = 94; 68.6%), involvement in playground games (n = 99; 75.5%), social relationships (n = 92; 67.1%) and involvement in sport (n = 69; %) would be improved. While 78 (57%) respondents felt that academic attainment levels could also be improved, only 25 (18.2%) felt that IQ could be impacted.

Q. 19-22 Levels of SENCO/LSC confidence in supporting members of the school community in terms of sensory provision

Finally, the survey addressed SENCO/LSC confidence in the area of sensory provision (Figure 6). This section was completed by 133 (97.1%) of respondents.

The overall confidence of this group of SENCOs/LSCs was low in all areas, particularly relating to teaching children about the impact of their sensory preference and aversions.
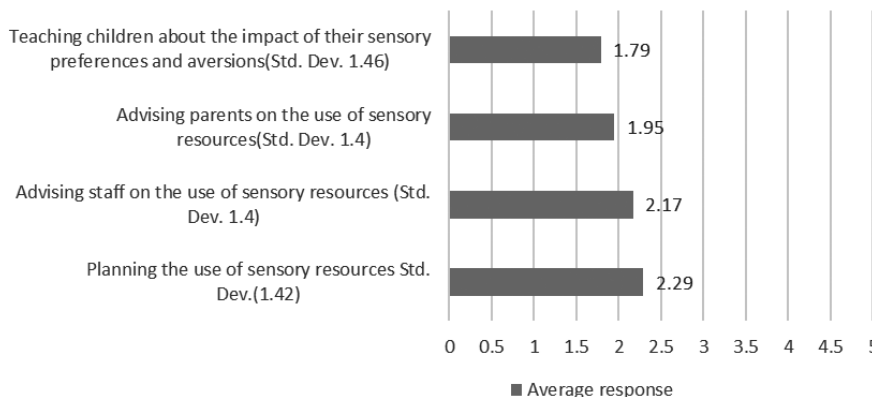
Discussion
In an absence of previous research, this study aimed to collate empirical evidence regarding current sensory provision in Northern Ireland's mainstream schools and to ascertain how such practice is informed. Given the

political (Buick, 2018) and financial uncertainty (Donnelly, 2017), industrial action and 'inescapable pressure' on all levels of the education system (Boyd, 2018, p. 3) at the time of the survey release, the design of this research aimed to avoid a low return (Denscombe, 2009), comply with union requirements and to engage schools and their staff at all levels. However, out of the 164 respondents (20.27%), only 137 (16.9%) felt that sensory provision was the remit of the mainstream primary school; a surprisingly low figure giving the raised profile of sensory need in mainstream schools (APA, 2013; Miller-Kuhaneck and Watling, 2018). Although sensory provision appears not to be a priority in this educational sector, this group of 137 respondents represented a core, invested group of schools from across all Educational Regions who were either currently making efforts to ensure sensory provision or who saw great value in sensory provision in the mainstream setting.

Current availability of sensory resources and sensory strategies and how these are being used
The results indicate that, in the respondents' schools, existing sensory resourcing was wide ranging (Figure 1). However, the number of 'time out' strategies and the use of fidget toys, stress toys and wobble cushions suggest that the focus remains on the reduction of inappropriate or unwanted behaviours; teacher support strategies rather than targeted, daily pupil support (Dean et al,

Q.19-22 Levels of teacher confidence: Average responses 0-5 Scale

Figure 6: Q.19-22 Levels of teacher confidence: Average responses 0-5 Scale

Item	Average response
Teaching children about the impact of their sensory preferences and aversions(Std. Dev. 1.46)	1.79
Advising parents on the use of sensory resources(Std. Dev. 1.4)	1.95
Advising staff on the use of sensory resources (Std. Dev. 1.4)	2.17
Planning the use of sensory resources Std. Dev.(1.42)	2.29

■ Average response

2018; Miller-Kuhaneck and Watling, 2018) designed to enhance pupil autonomy (ETI, 2018). While a small number of respondents appeared to be well-informed and aware of sensory terminology (n = 29; 21%) (Dunn, 1999; 2014), 78 (56.9%) used lay terms and their interpretations were often misconstrued; relating to general behavioural strategies, ASD strategies or calming activities. SENCOs/LSCs lacked confidence in identifying and evaluating need, supporting colleagues, parents and children. The concern arises that, even in schools whose ethos is proactive and invested in sensory provision, environmental and pedagogical adjustments to meet children's needs, few (n = 29; 21%; 3.6% of all schools contacted) have a reasonable awareness of what is required. When asked to name current sensory strategies, 30 (out of 62; 43.4%) suggestions were non-sensory specific. Across questions, sensory support was synonymous with calming, cooling down, relaxing activities and spaces or with activities and resources that provide movement breaks that burn off energy. Also, although many of the resources being allocated such as fidget toys, wiggle cushions and space hoppers related to hypo-sensitivity and sensory seeking behaviours, only six respondents (4.4%) suggested resources or strategies relating to hypo-responsive, non-seeking, under-stimulated children.

Benefits and challenges of sensory provision

Despite the lack of specific knowledge and practice, respondents were aware of the gaps in sensory provision and positive about the benefits of informed sensory practice.

> I really feel I would require more information as to what is available and to ascertain what would be appropriate for our setting. (Respondent 37)

> I am very keen to explore the potential for a sensory room/area/box. Space within our school is limited, but I do see the value of an area for sensory provision in some format within our teaching areas/ classroom. (Respondent 18)

The majority (n = 130; 94.9%) recognised the academic benefits of sensory provision (Wright and Conlon, 2009; Zentall et al, 2013; Anguera et al, 2017). More encouragingly, the majority of respondents expressed the view that appropriate provision could be beneficial for the social development and emotional well-being of the child, with particular emphasis on those children with existing emotional difficulties (n = 126; 92%) (McDonnell et al, 2015; Meredith et al, 2016; Serafini et al, 2017) and issues relating to attachment disorders (n = 114; 83.2%) (Gomez, A. and Sirigu, A., 2015; Summer et al., 2017). Interestingly, the importance of sensory provision for children with no identifiable SEN (n = 79; 57.7%) was rated more highly than six areas of medical or SEN, suggesting that these schools recognise sensory challenges in the general school population; a need for whole class as well as specialised provision.

Training, identification and provision

While Dean et al (2018) and Miller-Kuhaneck and Watling (2018) highlight the value of trained professionals in providing daily, individually directed sensory provision in the mainstream setting, findings suggest a lack of research or professionally informed training available to teachers in Northern Ireland and inconsistency in availability of trained teaching and non-teaching staff across schools. While 49 schools had some training from EAs, SEN services (35.8%) and Middletown Centre for Autism (17.5%), specific sensory training was sometimes sourced by schools or individual staff members, based on shared practice or by 'trial and error'.

> Nothing forthcoming from the Department or EA and we had children who needed particular provision in this area, so I sourced and paid for it from a private company. (Respondent 29)

> I received one day's training many years ago, but I keep in touch with OTs involved with pupils. (Respondent 1)

> Many ideas had to be researched by teachers through Edu twitter/social media etc. (Respondent 22)

While inter-professional collaboration and practice are advocated in Northern Ireland legislation (HMSO, 2015; 2016), only 34 respondent schools (24.8%) had specific OT training, and in seven cases (5.1%), training was for classroom assistants only rather than teaching staff, supporting the findings of the ETI (2019) and training was often in relation to a particular child rather than for general practice. The current resourcing and processes for putting strategies in place indicate that even best efforts could be misplaced and, at times, detrimental rather than beneficial to children's progress. While 46 of the 49 schools with sensory rooms or spaces had some form of training relating to the use of resources, training relating to the comorbidity of SPD and SEN beyond ASD was also lacking. The consequence of this is low confidence in respondents in identifying need, planning interventions, distributing resources and disseminating good practice to staff and parents (Figure 6). Given the importance of informed teachers informing children (Dean et al, 2018), respondents were least confident in teaching children about the impact of their sensory profiles, with a rating of 1.79/5 (Figure 6). Additionally, only 5 (3.6%) respondents used pupil report as an indication of sensory need. This absence of pupil understanding (Pagilano, 2012; Shanker, 2010) and voice in the process of sensory provision raises additional concerns about the efficacy of current practice. These findings are surprising in an educational environment where pupil voice (Adderley et al, 2015; Bragg, 2007; Chart eris and Smardon, 2019; DENI, 2014) and individualisation of support are increasingly prioritised.

Limitations

Although the response rate achieved was representative of the target population (n = 164; 20.27%) and representative of pockets of proactivity across all Education Regions, the final number of schools who felt sensory provision was necessary in the mainstream setting (n = 137) accounted for only 16.9% of all primary schools. It should be noted that this may be, to some degree, as a result of the current political, financial and educational environment. While the findings represent current practice in the Northern Ireland setting, the research supporting the role of Sensory Processing as key factor in children's holistic development is international. Consequently, the following recommendations should be considered in terms of developing educational pedagogy within and beyond the geographical remit of this case study.

Recommendations

Respondents confirmed the need for the development of specific sensory education for teachers and SENCOs/ LSCs (n = 124; 90.5%) to ensure that the impact of SPD on children's personal, social, emotional and academic development is understood. Teacher education, at Initial Teacher Education, Post-graduate and Continued Professional Development levels, grounded in cross-professional consultation with OTs, is recommended to enhance teacher knowledge, understanding and practice relating to the impact of sensory processing patterns across the diverse profiles which exist in the mainstream primary classroom. Equipped with this foundational grasp of the issues, teachers may be encouraged to build effective classroom practice between all participants: to identify, evaluate and adapt practice that may enhance pupils' daily educational experience (Dean et al, 2018; Miller-Kuhaneck and Watling, 2018). The purchase of resources, often mentioned as an obstacle to sensory provision, could then be more directed and cost efficient. The training of SENCOs/LSCs is also recommended for the development of a whole school approach to provision and a source of support for all members of the school community (DENI, 2015). While the majority of recent research-based sensory interventions in mainstream schools have been SEN focussed (Miller-Kuhaneck and Watling, 2018), respondents' comments suggest any new teacher education should support provision for children with SEN or medical needs but also those in the general classroom population.

Another essential recommendation is that support and resources are not given *to* children but that they are actively engaged *in the process*. There is a need for teachers to be confident in their ability to teach children about their sensory processing preferences and aversions, and the importance of seeking assistance and resources when necessary, to use learned strategies to modulate their own responses to sensory information. The introduction of a shared sensory vocabulary is recommended if sensory dialogue is to be achieved in the classroom and for pupil voice to influence teacher evaluation, planning and practice (Adderley et al, 2015; Bragg, 2007; Charteris and Smardon, 2019; DENI, 2020; DENI, 2014). In this way, sensory education in the classroom, like any educational practice, aims to develop independent learning and enhance pupil autonomy and well-being.

The final recommendation relates to the current, and potentially far reaching, impacts of the COVID-19 Lockdowns on children's mental health (Golberstein, Wen and Miller, 2020; Singh, Roy, Sinha, Parveen, Sharma, and Joshi, 2020). The findings of this research suggest that teachers support Ayres'(1969/1971) position that effective modulation of sensory information is essential to the development of an individual's self-esteem, self-control, self-confidence and social development. This being the case, now more than ever, educationalists need to take cognisance of how reduced sensory exposure over the COVID-19 period(Bruining, Bartels, Polderman, and Popma, 2020) has been impacting children in their homes and on return to the classrooms. Teacher knowledge and understanding of this issue are required across all schools if they are to be able to identify these effects, discuss these with children and support them in overcoming these challenges in the months and years ahead.

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