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An Exploration of Teachers' Perceptions of how the Classroom Environment Can Support Pupils with Autism Spectrum Disorder (ASD) in the Mainstream Primary School

This study sought to explore teachers' perceptions of how the classroom environment can be used to support learners with Autistic Spectrum Disorder (ASD). While knowledge about educational interventions for children with ASD is substantial, less is known about the design of supportive classroom environments (Martin, 2016, p.280). A qualitative approach was used, involving interviews with five primary-school teachers. The findings show that teachers viewed the physical and temporal environment as important for supporting learners with ASD. However, no teacher made significant adaptions to the physical structure of the classroom. Instead, adaptions to the design of the environment were made and in particular the use of visual supports in the environment. Teachers were more inclined to seek information and advice from colleagues than from courses or literature.

Keywords: *autism, classroom environment, visual aids, teacher perceptions, temporal environment.*

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INTRODUCTION

It has become widely acknowledged that individuals with Autism Spectrum Disorder (ASD) have a variety of skills, talents and needs. Our understanding of the condition continues to develop. One characteristic of the condition that is now accepted in recent years is heightened sensitivity to stimuli (McAllister, 2010; NCSE, 2015; Kanakri et al., 2017). The assessment criteria outlined in the

Diagnostic and Statistical Manual (DSM) 5 by the American Psychiatric Association (APA) now includes a vulnerability to sensory experiences within its diagnosis of ASD (APA, 2013), a criterion which was not recognised within the DSM 4 (APA, 1994). Indeed, a diagnosis of ASD often comes with an additional diagnosis of Sensory Processing Disorder (SPD) (Tomchek el al., 2014; Fernández-Andrés et al., 2015). In response to this understanding, several authors and researchers have documented the implications of an over-stimulating environment for the child's learning and behaviour. This has particular relevance for the classroom.

This study set out to explore how teachers perceive the potential of the classroom environment to support pupils with ASD, and to identify aspects of the classroom environment (if any) that teachers adapt to facilitate the sensory needs of these learners. The literature in this area was clear that there are multiple benefits to adapting the classroom environment, however, the researcher wanted to discover if these adaptations were being implemented in practice.

LITERATURE REVIEW

According to the World Health Organisation (2021), one in 160 children worldwide has a diagnosis of ASD. In Ireland, a recent study by the Department of Health (DoH) (2018) outlined the difficulties in estimating the prevalence of the condition, but concluded that "there is a robust case for adopting an estimated prevalence rate of 1- 1.5%" (p. 6) of the population.

The Education Act (Government of Ireland, 1998) stresses the importance of an education for every child and outlines the need for support services and quality education for children with Special Educational Needs (SEN). More specifically, the *Task Force on Autism* Report (DES, 2001) acknowledges the need for an "appropriate education" (p.11) for children with ASD. The report, however, fails to define the criteria and expectations of an "appropriate education". A recognition that adaptions should be made to the environment in which the child with SEN is educated is outlined in the Disability Act (Government of Ireland, 2005), where it specifies that "reasonable alterations" (p.43) should be made. In 2015, the National Council for Special Education reviewed the educational provision for children with ASD. A section of this report emphasised the need for structured learning environments, including visual structures, as a vital aspect of provision. It made suggestions as to how the sensory needs of the child could be provided for in mainstream classrooms. Such recommendations mirror those proposed for learners with ASD in other jurisdictions such as Scotland (see Dunlop et al., 2009).

The ‘learning environment’ refers to the setting in which the child learns and develops. For the purpose of this article, it refers to the classroom. The learning environment, sometimes referred to as the “third teacher” (Barrett et al., 2019), goes beyond the physical environment and includes “features” (Bokas, 2016, p.26) and “tools” (Carden, 2018, p.339) put in place for individual pupils. According to Blackmore et al. (2011) (cited in Hughes et al., 2019, p.241), the learning environment includes social, cultural, temporal, physical and virtual aspects

Making alterations to the physical aspects of the classroom is one strategy to support learners with ASD (Schilling and Schwartz, 2004; Dunlop et al., 2009; McAllister, 2010; Kanakri et al., 2017). However, according to Ring et al. (2018, p.75), having a Universal Design for Learning (UDL) approach, is more inclusive, where “being able to control light, temperature, background noise to a certain extent will both reduce stigma attached to those with sensory differences and promote access to learning for everyone.” But to promote UDL we need to firstly understand the profiles and needs of learners who differ from ‘typically-developing’ or ‘neurotypical’ children. One difference can be issues with sensory integration.

Considering the sensitivity many children with ASD have to visual stimuli, the over-use of environmental visuals seems to be a recurring concern in the literature due to the impact on learning and engagement within the classroom (Kuhaneck and Kelleher 2015). Oliver (2016) acknowledges an appropriate learning environment as one which avoids sensory overload which would typically present as that with excessive classroom displays. Hanley et al. (2017) confirmed the negative effects of excessive classroom displays on pupils’ learning using eye-tracking technologies. They found the presence of visual displays had a significant impact on attention for all children, but particularly those with ASD. The longer these children attended to visual stimuli in the environment, the poorer their learning outcomes in individual lessons.

Conversely, research and literature have recognised the positive effects of certain visuals within the classroom environment which causes a conflict for teachers. Educational methodologists such as Good and Brophy (2000), Kyriacou (2007), Muijs and Reynolds (2011), Bonfield and Horgan (2016) and Tynan (2018) highlight the benefits of visual aids to stimulate discussion, encourage peripheral learning and act as a scaffold to learning. But it is essential that there is not an overuse of visual aids in the classroom leading to overstimulation of the child with ASD.

According to Piller and Pfeiffer (2016) the "temporal aspects of the environment play an essential role in the participation of children with ASD" (p. 109). This includes the timing and sequence of activities and routines. A visual schedule provides support for transitions and independence, making it a support within both the physical and the temporal environment. These schedules or 'visual timetables' provide the routine needed for children with ASD (McAllister and Maguire, 2012). They are useful in mainstream settings to promote on-task behaviour (Macdonald et al., 2018). Oliver (2016) noted that knowing the next step in the daily routine "provides structure, predictability and consistency" (p.148) for learners. A comprehensive literature review by Knight et al. (2015) showed that visual schedules could be deemed to be an evidence-based approach for individuals with ASD, showing the success of its use across various settings for individuals of all ages.

Despite the research carried out on the benefits of adapting the physical and temporal environment for the learner with ASD, the question remains: to what degree do class teachers know about, and make adaptations to, the learning environment to support pupils with ASD?

METHODOLOGY

This study used a qualitative approach to emphasise participants' experiences of ordinary events in natural settings (Punch, 2009). Qualitative research seeks to reveal "the authenticity of human experience" (Silverman, 2010, p. 6); in this case how participants perceive the use of the classroom environment to support learners with ASD in mainstream schools. The method of data collection was one-to-one semi-structured interviews by the first author. This helped to reduce the power differential of the researcher-participant relationship (Creswell, 2007).
The researcher used non-probability purposive sampling to interview five primary school teachers, in both rural and urban mainstream schools, in one West of Ireland county, who had experience of teaching children with ASD. Two of the participants worked in the same school: one was working in an ASD special class while the other was a mainstream class teacher. The remaining three teachers were mainstream class teachers at the time, one of whom had several years' experience working as a Special Education Teacher (SET).

The risks associated with any study can never be eliminated, however, steps can be made to minimise them. The researcher ensured that she was aware of her own values and beliefs to reduce bias. This was done through the use of a reflective

diary and through piloting the interview. Ensuring non-maleficence is essential when conducting educational research (Cohen et al. 2017); the researcher ensured all interview questions were non-biased, not leading and avoided any offence or distress for the participants (Cohen et al. 2017). All participants received both an information letter (to understand the aims and scope of the research) and an informed consent form. The information letter specified the participants' rights throughout the study, including their voluntary participation and their right to withdraw from the study at any stage without consequence. Confidentiality and an absence of traceability were at the foundation of ethical considerations (AERA 2011). Ethical approval was received from the Mary Immaculate Research Ethics Committee of Mary Immaculate College, Limerick.

The interviews were digitally recorded and transcribed. The data was analysed thematically using Braun and Clarke's six phase approach (2006), beginning with familiarisation with the data by reading the transcripts. The coding process then began by assigning 'initial codes' to the transcripts using an inductive analysis approach. The codes were sorted, and similar codes were combined. It was from these combined codes that themes emerged which were then reviewed and final themes were produced.

This research has a number of limitations. It has a very small sample size with participants selected from one county only; a larger sample of a wider geographical region would allow for greater credibility and transferability. It is also acknowledged that, in retrospect, certain responses from participants could have been further probed and discussed to glean more streamlined data.

FINDINGS AND DISCUSSION

Two main themes emerged from the data: the physical environment and the temporal environment.

The physical environment

Teachers talked about supporting the child with ASD through different aspects of the physical environment including visual schedules and classroom organisation. All participants found visual schedules to be very beneficial for children with ASD so "they know what's happening next" (Participant (P)5). P3 stated that the child in her class "has a coloured timetable on her table so it's very visual" adding that this means "the subjects [are] laid out clearly" for her. The success of visual schedules noted in various studies has lead them to being deemed an 'evidence-based approach' for individuals with ASD (Knight et al., 2015). However, the

participants found that visual timetables and schedules worked well for **all** children in the class (P1, P2, P5), highlighting the fact that specialised approaches can also benefit the typically developing learner (Oliver, 2016; Ring, 2018) This underscores the value of a UDL approach (Westwood, 2013). Another participant (P1) described the use of a visual schedule for the whole class and "a personal timetable" for the child with ASD to show that sometimes individual adaptations are needed.

In addition to the use of visual schedules, classroom organisation or the physical structure of the classroom, was also acknowledged by some participants. Two of the five teachers emphasised the importance of providing organisation boxes (P3) or an organisation shelf (P2) to help support the child in the classroom. This correlates with findings by Goodall (2015). It was suggested by P5 that the children need a "safe place" within the classroom which links to the works of Macdonald et al. (2018) who promote the use of structured work systems for pupils with ASD.

It was interesting to note that no teacher made physical changes to the classroom environment in terms of light, sound, furniture or floor covering. The participants were asked to discuss what adaptions they would make to the classroom set-up in order to facilitate a child with ASD, however they were not probed to discuss light, sound, furniture or floor covering to avoid leading questioning. They possibly focused on changes with which they felt they could control themselves. Such physical changes to, e.g., light, would typically support the sensory needs of the learner with ASD (Dunlop et al. 2009) but may have funding implications. Teachers did not mention the possible impact of classroom sensory stimuli on the learner with ASD which has the potential to decrease concentration and increase anxiety and behavioural issues (Howe and Stagg, 2016). Similarly, many authors posit that classrooms can provide an over-stimulating environment for pupils with ASD through the over-use of visual displays (Kuhaneck and Kelleher, 2015; Oliver, 2016; Hanley et al., 2017). The findings of this study showed only one participant (P2) acknowledged this concern and outlined how she would seat a child somewhere "with not too many distractions". It is not clear if a lack of awareness by the other participants of the impact of over-stimulating learning environments for learners with ASD prevented them from discussing this strategy.

The temporal environment

The temporal environment has strong links to the physical environment whereby the daily sequence of activities can be displayed through a visual timetable (Ring, 2018). All participants referred to their attention to the temporal environment to support learners with ASD. P5 acknowledged that the school day "needs to be very

structured for them" (P5). Three of the five teachers in the study discussed how they provided a structured routine within the classroom for the child with ASD (P1, P3, P5). The participants that referred to routine conveyed its importance in supporting the child, stating that "everything has a routine in this class" (P1) and that "definitely having routine" impacts the child's learning (P3). This sense of routine helps to reduce learner anxiety and supports organisational skills (Dunlop et al., 2009).

The participants also recognised the implications of allowing for "transition times" during the daily routine (P2) and had an understanding that the child needed to be informed in advance when there was a change in the daily schedule (P3, P5). In addition, a need for sameness was a feature of ASD which was recognised by P4 and P5 and was a factor in decision making within the classroom when adaptions were necessary. The participants understood that these changes were necessary for the child's development stating: "I couldn't imagine if you … make no allowances for anything and made no changes to the way anything was done, that they would flourish" (P1). This difficulty with changes to routines is linked to the cognitive theory of executive dysfunction, a key aspect of ASD (Boucher, 2017).

CONCLUSIONS AND RECOMMENDATIONS

The findings showed that the temporal environment was a greater consideration for teachers than adaptations to the physical environment to support learners with ASD in the mainstream classroom. Visual timetables were found to be a vital resource in the classroom for all participants, not just for pupils with ASD but for all pupils. It was also found that teachers did not make changes to the physical classroom environment which may indicate a lack of awareness of the significance of environmental impact on the sensory needs of a pupil with ASD but also the fact that such changes require more consultation, time and money. In addition, teachers highlighted the benefits of classroom routines and highly organised classrooms to support the psychological safety of students. In light of these findings, a number of recommendations are made.

1. A Universal Design for Learning (UDL) should be adopted by teachers. This means fewer adaptations would be needed when a student with ASD would be in the class. To this end, visual timetables, routines for transitions within the classroom and an organised physical environment should be part of the structure of every classroom.
2. To fully understand the needs of learners with ASD, including their likely sensory needs in the classroom context, teachers are encouraged to engage

with high quality professional development using the expertise of staff members, attending courses in local education centres or through Middletown Centre for Autism or those organised by the National Council for Special Education. Many third level institutions also offer accredited courses in supporting learners with ASD, such as the Graduate Certificate/Diploma in Autism Studies offered by Mary Immaculate College.

3. As practical strategies for teachers, the learning environment should be structured with clearly defined curriculum areas on display in designated areas, rather than random items hung on the walls in a disorganised fashion. The student with ASD should be seated in an area where they have minimal distractions (which will vary from student to student and from classroom to classroom). Data projectors should be switched off when not in use and natural light should be available in the classroom whenever possible to avoid the use of fluorescent classroom lights.

Due to the small sample used for this study it must be clarified that these results cannot be generalised and further research using a larger sample size would be appropriate. It is also important to acknowledge that changing the classroom environment alone is not a solution to the inclusion of children with ASD in mainstream schools, it is "only one component to consider" (Mcallister and Maguire 2012, p. 111). Perhaps most importantly in future research it is essential to explore the experiences of learners with ASD to ascertain the impact of sensory stimuli on their learning in the mainstream classroom.

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