
International Journal of Student Voice

A peer-reviewed, independent, open-access journal

Pennsylvania State University

Volume 6, Number 7

IJSV

2021

The Impact of Innovative Learning Environments on Sensory Processing Difficulties: Students' Perspectives

Rachael Busch and Vijaya Dharan

Institute of Education, Massey University, New Zealand

Citation: Busch, R. & Dharan, V. (2021). The Impact of Innovative Learning Environments on Sensory Processing Difficulties: Students' Perspectives. *International Journal of Student Voice*, 6(7). <https://sites.psu.edu/ijsv/volume-6/>

Abstract: New Zealand's education policy and practice is fast moving towards innovative and collaborative approaches to learning, to improve outcomes for all students. One of the ways to achieve this has been creating learning environments that foster acceptance of diversity, build relationships, and enable the active participation of students through Innovative or Flexible learning environments. Current literature, however, suggests that the move to collaborative learning spaces and the introduction of Innovative Learning Environments (ILEs) has been inconsistent, with a lack of understanding of the pedagogical nuances to fully realise their inclusive capacity. This article draws from a study that examined

students' participatory rights under the United Nations Convention for the Rights of the Child (UNCRC) with a focus on Article 23.1 in enabling students with Sensory Processing Difficulties (SPD) to actively participate in their learning. Using a qualitative design, the study explored the perspectives and experiences of 10 secondary school students with SPD in an ILE setting. The findings highlighted the positive impact of ILE and the social benefits of schooling. The students showed a strong preference for ILE over traditional classrooms, as it created a learning environment that afforded more opportunities to work with their peers. These social affordances were at times constrained in ways the physical spaces were utilised, without due consideration to their acoustic sensitivities. One of the key implications of this study was the need for a more sophisticated pedagogy that would maximise the benefits that ILEs offer, to enhance the participation of students with SPD. The study demonstrated a high level of perceptiveness and insightfulness of the students that must be heard and acted upon as a matter of their rights to *actively participate* in their learning communities.

Keywords: learning environments; sensory processing, student voice; pedagogy, children's rights

Introduction

Over recent decades, New Zealand Education policies and practices have shifted to being inclusive of all learners. The Education & Training Act (2020), provides all students, regardless of ability or disability, the right to attend their local school. In accordance with national and international legislation and imperatives,

the New Zealand education system has embraced a rights-based inclusive model of education that ensures every child the right to access quality education. Central to this inclusive notion is the holistic approach to student well-being, that fosters acceptance, builds relationships and enables students to be active participants in their learning community (MacArthur & Rutherford, 2016; Ministry of Education, 2020).

Meaningful participation of all children require school policies and classroom practices that upholds and supports the learning of all children. However, as MacArthur and Rutherford (2016) argue, current policies in the New Zealand education system continue to marginalise some students, and call for more equitable, inclusive systems that are responsiveness to the needs of all children. Equitable access is about the participation, and agency of children and young people in their learning. At the core of participation is active engagement in educational experiences that are essential for every individual's development and well-being. Being actively involved in their learning can be challenging and is influenced by personal and environmental characteristics for many children with diverse needs, one of them being inadequate teacher knowledge and skills to facilitate learning that supports and nurtures the capabilities of all students (Florian, 2014). Schools have an ethical and legal obligation to recognise student diversity, to value their unique contribution to society and preserve every child's fundamental right to participate (Florian, 2014; MacArthur et al., 2018).

The premise of Innovative Learning Environments (ILEs) is that they encourage students to be active players in their learning (Charteris & Smardon, 2019; Quinn & Owen, 2014). Despite growing research on ILEs, the perspectives of students with SPD in them is relatively sparse. This article is based on a study predicated on children's rights and explored ways in which Innovative Learning Environments (ILEs) supported the right of students with sensory processing needs (SPD) to learn. Sensory Processing Difficulties or SPD (also referred to as Sensory Integration Dysfunction), is a collection of conditions that relate to difficulties in the central nervous system (CNS) to detect, interpret, modulate, and respond to internal and external sensory stimuli. Sensory processing difficulties often occur as a co-morbid condition in individuals with autism and attention deficit hyperactivity disorder (ADHD) (Dunn, 2008; Ghanizadeh, 2011), auditory processing difficulties and anxiety (Khare & Mullick, 2009). Participating in classrooms can be challenging for students who have difficulty in processing sensory information. Thus, the shift to both inclusive and innovative schooling rests on the planned use of the physical space, as well as a well-tailored pedagogy that will enable the participation of all students (Khare & Mullick, 2009). As there is limited research on the perspectives of students with SPD, their experiences of learning in an ILE can contribute to educators' knowledge of how these future focused learning environments both enable and create barriers for students with diverse needs.

Innovative Learning Environments and SPD

In New Zealand there has been a shift from traditional teaching to new innovative ways of learning in line with the changing 21st-century world that

requires digital literacy, collaboration, critical thinking and problem-solving (Cardno et al., 2017; OECD, 2015). In response to these changing paradigms, traditional classrooms are moving to be Innovative Learning *Environments* (ILE), also referred to as *Modern Learning Environments* and Flexible Learning Environments. ILEs are flexible learning spaces that foster an inclusive learning environment that is student-centred, self-directed, and more attuned to individual difference (Ministry of Education, 2020). ILE are designed to afford schools and teachers to modify and adapt the physical, social, and pedagogical context of learning in a bespoke manner to be responsive to all learners.

The conception of innovative learning was founded in the Organisation for Economic Co-operation and Development's (OECD) Centre for Educational Research and Innovation (CERI) project, and aimed at understanding the modern child, their fast-changing world, especially in the digital age, and its implication for their education and learning. A second and possibly crucial driver for the research into learning was the worldwide economic push to identify the capability of education systems to develop and maintain "knowledge, skills and capacities" (OECD, 2015, p.16). With this came a shift from knowledge acquisition to learning about learning and innovative systems—systems that proactively adapt and change with the world children live in, equipping students with the necessary skills to become powerful learners, skilled workers and engaged global citizens (OECD, 2015).

ILEs are interconnected ecosystem of people (learners, educators, whānau, wider communities; pedagogical practice; and the physical space where learning

takes place (Ministry of Education, 2020; OECD, 2015). Learners become the centre of teaching and learning through flexible classroom teaching and the flexible spaces in them are designed to maximise learning opportunities for all students (Ministry of Education, 2020). Flexible learning within ILEs utilises multi grouping of students and facilitates social and collaborative learning to where students learn with and from their peers (Ministry of Education, 2020; OECD, 2015). In short, the social context of learning in ILEs is geared up to promote self-directed and self-regulated learners (Ministry of Education, 2020; OECD, 2015).

Independent Learning Environments has many affordances conducive to student-centred learning, but it has not been without its critics, or concerns. Central to the effectiveness of ILE is a sound understanding of its foundational focus on student-centred learning (Kedian & West-Burnham, 2017; Smardon et al, 2015). A study by Bradbeer et al. (2017) suggests a lack of evidence in the suitability of ILE and 21st-century learning to support the significant investment in ILEs. There are still significant amounts of teacher-centric pedagogy in ILEs (Bradbeer et al. 2017). While there is a willingness to modify physical spaces, there is less understanding of the pedagogical nuances of ILE, and the systemic changes required to ways of working (Byers et al, 2018).

At a conceptual level, it would appear that the physical space and pedagogy of ILE would support the needs of students with SPD. However, research seeking the perspectives of school leaders, teachers and parents suggest that while the collaborative nature of ILEs do offer ample opportunities for collaborative learning

and social interactions, it also increases anxiety levels for children with SPD who have difficulties in communication and social interactions (Khare & Mullick, 2009). While the large open spaces of ILEs provide a range of physical options for learning activities, other variables such as larger class sizes and constant movement of students, acoustics and lighting can be over stimulating and challenging for those with SPD (Jones et al, 2020; Khare & Mullick, 2009; Stackhouse, 2017). After nearly a decade of the introduction of ILEs in New Zealand, there remains varying degrees of teacher knowledge and professional learning (Cardno et al., 2017; Kedian & West-Burnham, 2017; Smardon et al., 2015).

Child Rights and Education

At the 1989 United Nations Convention on the Right of the Child (UNCRC), the United Nations adopted the comprehensive Human Rights treaty that recognised, defined and enshrined universal principles and standards for the status and treatment of children in international law. The UNCRC acknowledges that children and young people are both members and stakeholders in society (Lundy, 2007; MacArthur & Rutherford, 2016). Accordingly, the UNCRC recognises child's rights inherent to all humans, and defines universal principles and obligations for the treatment and protection of children and their well-being. The fundamental principles of the UNCRC are *the provision* of growth and development through housing, food, education, and leisure; *protection* against exploitation, abuse, and discrimination; and *participation*.

Of the 52 articles identified in UNCRC, it is largely Article 12 that lays the foundations for the commitment to develop systems and practices that provide children and young people with opportunities to exercise their rights to voice their views and participate in decision-making (Lundy, 2018). Furthermore, Article 2 of the UNCRC protects children's rights without discrimination of any kind, including that of the rights of children with disabilities to actively participate in their community. The UNCRC convention sets a clear mandate to ensure that children with diverse needs are afforded equal opportunity to voice their perspectives and be able to exercise their right to actively participate in their learning community. Further, as a signatory to the Convention for the Rights of Persons with Disabilities (CRPD) (The United Nations, 2006), New Zealand has a legal obligation to ensure that educational institutions and schools promote and protect the rights of children with diverse needs to help them reach their full potential (CRPD Article 24). Yet, voices of children and young people are significantly underrepresented, although they can provide insights that are very different from those of teachers and school leaders (Hafen et al., 2012; MacArthur & Rutherford, 2016). Children must be viewed as competent and valuable social actors whose experiences and views provide valuable insights and information (Smith, 2016). Failure to include their perspectives amounts to overlooking their rights to contribute to matters that are relevant to them. Lundy (2007) calls for upholding the legal and ethical obligations of the UNCRC's Article 12 by moving beyond tokenism and create genuine *spaces* for students to be heard and *influence* decision-making.

The fundamental building block of ILE is the active construction and social negotiation of learning that embraces learner agency, where students are active participants in their learning.

Method

This study explored *the affordances and barriers of the social and physical dimensions of ILEs on the active participation and learning of students with* Sensory Processing Difficulties (SPD). Five girls and five boys with Sensory Processing Difficulties (SPD), or co-occurring SPD, aged 13–15, in Years 9 and 10 at school participated. The qualitative approach of semi-structured interviews enabled the exploration of contextual relationships and individual realities of the students who learn in an ILE (Braun & Clark, 2013; Punch, 2014). The perspectives of the students on their learning were insightful in both the social and physical contexts of their learning environment. The participants were identified by the school and consent to participate was obtained from both parents and the students. Data were collected through individual face-to-face interviews using semi-structured, open-ended questions (Braun & Clark, 2013), that allowed for flexibility and in-depth responses from participants that provided insights into their experiences of learning in the social and physical dimensions of an ILE. Bronfenbrenner's ecological framework was used to explore the interconnected relationships between the dynamic structures of the social and physical space of an ILE and how they interact with, and impact on, the learning and development of young people with sensory processing disorder.

Social Learning Context

The findings reflected the students' experiences and preferences for independent and group work, and the positive aspects as well as challenges they experienced in the ILE. A founding principle of ILE is the belief that as humans we are social and collaborative beings, accordingly learning must be social (Ministry of Education, 2020; OECD, 2015). Within the social context of learning, three key ideas emerged: *preference for learning*; *collaborative learning*; and *friendships*, which enhanced their learning and participation.

In the socially demanding setting of their ILEs, the students were provided opportunities to work independently as well as in a group. Some of the students had difficulties working independently because they could not learn from their peers when tasks were difficult. For them, the context of group work afforded mutual support for learning from one another.

There's less work if I get partnered with a really good person we get a lot of work done because we split it up and manage it easier [...] you also have different skills in a group, someone might be really good at designing posters and someone might be good at finding information. (Sara, Year 10)

Because if my friend is doing work then I want to do it. My friends always want to do work and they tell me to do it; they help me focus. (Austin, Year 9)

On the contrary, for some, group work was difficult and distracting. For these students working independently afforded a sense of greater autonomy.

Usually when I'm in a group of people I have to step up and be the leader to get them to focus because most of the kids in my class, they can be a bit silly...it's very hard for me to focus so I get distracted or distract others sometimes. (Mark, Year 10)

I always know how to write things and when other people do it it's confusing and it confuses me sometimes. (Kim, Year 9)

Last year I worked with a few of my friends on a group project, it was social studies and we had this presentation thing and I was the only one person doing work while the others were just playing games. (Ethan, Year 10)

Joshua (Year 10) expanded on how he copes with the distractions of group work, "if people are distracting me, I will carry on doing my work on my own and just not participate in the group".

The students felt there was less pressure when working independently as they need not have to worry about letting their group down.

There's no one else trying to put their opinions in or ideas. It can be exactly what I want. Also, there's a lot of pressure because we have to set our own deadlines sometimes and I might not be able to finish it by then and I'm letting my group down. (Sara, Year 10)

Despite the advantages of working independently, there was a strong preference for working with friends. *Friend groups* significantly enhanced collaboration and supported their learning, as they knew and understood each other's capabilities and differences.

*My friends help me lots because I find school really hard work. (Jack, Year 9)
I usually engage with learning with people I know like my friend group
because it's awkward talking with other people. I get to work beside someone
and I can rely on them more. (Hana, Year 9)*

Impact of Physical Space

A feature of ILE is the shared space of large open classrooms, which these students found both supportive as well as being a barrier to their learning. Two inter-related subthemes emerged on the impact of the physical space on their learning—*Noise* and *Class size*.

The most significant and commonly discussed challenge of the ILE was 'noise'. All the students liked the freedom of the large open spaces and breakout rooms to learn, but at times the acoustics was a major source of distraction, given their auditory sensitivity. Children reported distractions arising through the open space of the classroom. Physically, acoustically, and visually the classrooms were distractive, as were the large number of students within these spaces.

*It's awkward and spacious and more people. Everyone is moving. It gets
loud a lot. (Hana, Year 9)*

As soon as one teacher can't get control of the class that class gets noisy and then another class starts to get noisy and then no one is doing their work. And then there is all the noise and distractions, and I can't focus on what I'm doing. (Sara, Year 10)

Noise levels had a direct impact on their ability to focus and concentrate:

Noise, lots of things going on at one time. I can only focus on one thing usually, so it's very hard for me to focus when there are lots of people around me and lots of people talking. (Mark, Year 10)

When it's noisy I just sit there. (Jack, Year 9)

I don't really do anything, I just sit there. (Anahera, Year 9)

Learning for long periods of time in a noisy environment was tiring and had an impact on students' energy levels. Gloria (Year 9) reported she felt exhausted after school, "because I struggle filtering out noise and so lots of people in the space is so tiring". Some of the students went to closed rooms and used headphones with music playing to filter out the noise.

Despite their sensitivities to noise, an important finding of this study was that many of the participants preferred the open design of an ILE to their traditional classrooms. With this preference came the key message from the students to not overcrowd ILEs.

I do think I prefer the open space than the old small ones. But don't merge three other classes half the time, you feel lost. (Joshua, Year 10).

Discussion

ILEs are designed with multiple spaces including breakout areas that promote social interactions and enables students and teachers the flexibility to use areas in different ways (Ministry of Education, 2020). Key features of pedagogy in an ILE is the use of collaborative working patterns, aimed at utilising both teachers' and students' strengths and expertise. ILEs are designed to provide flexible learning opportunities for students to work both independently and in social groups to meet the needs of students.

Despite a general assumption that students with SPD and other conditions that are characterised as having sensory sensitivities struggle in socially demanding ILEs, half of the participants preferred to work in collaborative groups, and found it to be a positive learning experience as seen in earlier studies (e.g., Magen-Nagar & Steinberger, 2017). The flexibility of learning tasks and the space afforded choices for students to work either in groups, or independently. Hafen et al. (2012), suggest that autonomy and a sense of control over one's choices are deeply influential in promoting engagement and participation of adolescents; the social environment of ILE's provided opportunities for these students to exercise their autonomy and their preference for working. The dynamics within the social contexts of the classroom played a pivotal role in determining the extent to which they were involved in, and engaged with, their learning. Overall, the findings suggest that social, collaborative learning and flexibility of group work enabled the students to engage meaningfully with their learning.

The physical space of a classroom organisation has a sizable influence on students' learning (Jones et al., 2020). The notable finding of this study was the impact of noise level on participants' given their sensory sensitivities. While for some working independently was a confidence booster, often they worked independently not by choice, but due to inadequate considerations given to their acoustic sensitivities. It resulted in learner distraction, disengagement, and fatigue, with students experiencing sensory overload (Foxe et al., 2020; Ghanizadeh, 2011). Simple ecological adaptations by teachers such as allowing them to use devices like headphones to filter noise levels, alleviated distress, and decreased distractibility in the learning spaces.

The Ministry of Education (2020) require ILE classrooms to have specific architectural design elements to reduce noise. However, in addition to best designing, pedagogical practices of teachers must undergo some transformational changes as ILEs will not function adequately without suitable pedagogy (Kariippanon et al., 2019; Whitlock, 2016). One of the key features of ILEs is the co-sharing and co-teaching of classes in a common space. Therefore, crucial to student participation is teachers' competence in capitalising on the affordances of the physical space, understanding the specific learning requirements of students and developing practical and authentic strategies to mitigate environmental challenges. More importantly, schools have a legal obligation to promote the active participation of children and young people in all aspects of their learning by acknowledging their right to be heard on what supports their learning (Lundy, 2007; Quinn and Owen, 2014).

Conclusion

The study explored the impact of ILEs on students' rights to actively engage in their learning community in accordance with UNCRC Article 23.1, which states, "a mentally or physically disabled child should enjoy a full and decent life, in conditions which ensure dignity, promote self-reliance and facilitate the child's active participation in the community". The findings suggest that ILEs are successful in providing autonomy and choice, and in developing citizenship by affording students the opportunity to be actively involved in their learning. Although sensory challenges can become barriers to learning, students with SPD thrive within supportive and carefully structured environments, where teachers play a critical role in providing carefully considered collaborative learning experiences. The preference for independent and group learning even within this small cohort of students, offer valuable insights as to how teachers can support students with SPD within the context of an Innovative Learning Environment (ILE).

When students identify class sizes and noise levels as barriers in ILEs, it highlights the fact the need for paying more attention to the pedagogical adaptations required in these learning environments. In an attempt to remain future focused, ILEs are capable of *evolving and adapting* to enable students to actively participate in their learning. Yet, the conceptual ideals of ILE pedagogy is still work in progress. It is possibly due to the affordances of flexible learning spaces are viewed from teachers' perspectives and benefits of collaborative planning and teaching. While what remains largely unexplored is the impact of noise levels and

effective use of the physical environment (Kariippanon et al., 2019). Students with SPD have identified their difficulties in coping with noise levels and large class sizes. Therefore, to ensure that learning environments are equitable, it is vital to respond to their concerns through practical ecological adaptations. This study has shown that irrespective of their sensory challenges students are insightful of what supports their active participation and learning. They can contribute to ways in which their learning can be further enhanced in Innovative Learning Environments, which was preferred over traditional classrooms. Young people's voices must inform the designing of pedagogy in these future focused learning spaces.

References

Bradbeer, C., Mahat, M., Byers, T., Cleveland, B., Kvan, T., & Imms, W. (2017).

The "state of play" concerning New Zealand's transition to innovative learning environments: Preliminary results from phase one of the ILETC project. *Journal of Educational Leadership, Policy and Practice*, 32(1), 22–38.

Braun, V., & Clark, V. (2013). *Successful qualitative research: A practical guide for beginners*. Sage Publications.

Byers, T., Imms, W., Hartnell-Young, E. (2018). Evaluating teacher and student spatial transition from a traditional classroom to an innovative learning environment. *Studies in Educational Evaluation* 58, 156–166.

DOI:10.1016/j.stueduc.2018.07.004

Cardno, C., Tolmie, E., & Howse, J. (2017). New spaces – new pedagogies:

Implementing personalised learning in primary school innovative learning environments. *Journal of Educational Leadership*, 32(1), 111–124.

<https://doi.org/10.21307/jelpp-2017-010>

Charteris, J., & Smardon, D. (2019). The politics of student voice: Unravelling the

multiple discourses articulated in schools. *Cambridge Journal of Education*, 49(1), 93–110. <https://doi.org/10.1080/0305764x.2018.1444144>

Dunn, W. (2008). Sensory processing: Identifying patterns and support

strategies. In K. D. Buron, & P. Wolfberg, *Learners on the autism spectrum : preparing highly qualified educators* (pp. 139-160). Autism Asperger

Publishing Company.

Education & Training Act (2020).

<https://www.legislation.govt.nz/act/public/2020/0038/latest/LMS170676.html>

Florian, L. (2014). What counts as evidence of inclusive education? *European Journal of Special Needs Education*, 29(3), 286–294.

<https://doi.org/10.1080/08856257.2014.933551>

Foxe, J. J., Del Bene, V. A., Ross, L. R., Ridgway, E. M., Francisco, A. A., &

Maholm, S. (2020). Multisensory audio visual processing in children with a sensory processing disorder (II): Speech integration under noisy

environmental conditions. *Frontiers in Integrative Neuroscience*, 14, ArtID:

39. <http://dx.doi.org/10.3389/fnint.2020.00039>

Ghanizadeh, A. (2011). Sensory processing problems in children with ADHD: A systematic review. *Psychiatry Investigation* 8(2), 89-94.

DOI:10.4306/pi.2011.8.2.89

Hafen, C.A., Allen, J. P., Mikami, A. Y., Gregory, A., Hamre, B., & Pianta, R. C. (2012). The pivotal role of adolescent autonomy in secondary school classrooms. *Journal of Youth and Adolescence*, 41(3), 245–255.

DOI: [10.1007/s10964-011-9739-2](https://doi.org/10.1007/s10964-011-9739-2)

Jones, E. J., Hanley, M., & Riby D. M. (2020). Distraction, distress and diversity: Exploring the impact of sensory processing differences on learning and school life for pupils with autism spectrum disorders. *Research in Autism Spectrum Disorders*, 72. <https://doi.org/10.1016/j.rasd.2020.101515>

Kariippanon, K. E., Cliff, D, P., Lancaster, S. J., Okely, A. D., & Parrish, A. (2019). Flexible. learning spaces facilitate interaction, collaboration and behavioural engagement in secondary school. *PLoS ONE*, 14(10), 1–13
<https://doi.org/10.1371/journal.pone.0223607>

Khare, R., & Mullick, A. (2009). Incorporating the behavioural dimension in designing inclusive learning environments for autism. *International Journal of Architectural Research*, 3(3), 45–64.

<https://doaj.org/article/042002c4cfda4d4b823f54e05de099a6>

Lundy, L. (2018). In defence of tokenism? Implementing children’s right to participate in collective decision-making. *Childhood*, 25(3) 340–354.

Lundy, L. (2007). ‘Voice’ is not enough: conceptualising Article 12 of the United Nations Convention on the Rights of the Child. *British Educational Research*

Journal, 33(6), 927–942. <https://doi.org/10.1080/01411920701657033>

MacArthur, J., McIlroy, A., & Howard, T. (2018). What made school so good? In J. Berman & J. MacArthur (Eds.), *Student perspectives on school: informing inclusive practice* (pp. 111–127). Leiden; Boston: Brill Sense.

MacArthur, J., & Rutherford, G. (2016). Success for all? Re-envisioning New Zealand Schools and classrooms as places where 'rights' replace 'special'. *New Zealand Journal of Educational Studies*, 51, 157–174. <https://doi.org/10.1007/s40841-016-0066-8>

Magen-Nagar, N., & Steinberger, P. (2017). Characteristics of an innovative learning environment according to students' perceptions: actual versus preferred. *Learning Environment Research* 20, 307–323. <https://doi.org/10.1007/s10984-017-9232-2>

Ministry of Education. (2020). *Innovative Learning Environments*. <http://elearning.tki.org.nz/Teaching/Innovative-learning-environments#jstabcontainer-1-tab-1>

OECD. (2015). *Schooling redesigned: Towards innovation learning systems, educational research and innovation*. OECD Publishing.

Punch, K. F. (2014). *Introduction to social research: Quantitative and qualitative approaches* (3rd ed.). Sage.

Quinn, S., & Owen, S. (2014). Freedom to grow: Children's perspectives of student voice. *Childhood Education*, 90(3), 192–201.

<http://dx.doi.org/10.1080/00094056.2014.910367>

Smardon, D., Charteris, J., & Nelson, E. (2015). Shifts of learning eco-systems: Principals' and teachers' perceptions of Innovative Learning Environments. *New Zealand Journal of Teachers' Work*, 12(2), 149–171.

<https://eric.ed.gov/contentdelivery/servlet/ERICServlet?accno=EJ1230294>

Smith, A. B. (2016). *Children's rights: Towards social justice*. Momentum Press.

Stackhouse, J. (2017). *The impact of 'place' on Autistic children: The move towards collaborative/flexible learning spaces in New Zealand and the needs of children on the autistic spectrum*. (Unpublished Ministry of Education Primary Principals sabbatical report). Christchurch.

United Nations General Assembly. (1989). *Convention on the rights of the child*. Geneva, Switzerland.

<https://www.ohchr.org/en/professionalinterest/pages/crc.aspx>

United Nations, (2006). *United Nations Convention on the Rights of Persons with Disabilities*. United Nations

<https://www.un.org/development/desa/disabilities/convention-on-the-rightsof-persons-with-disabilities.html>

Whitlock, J. (2016 November 9–11). *Innovative Learning Environments the good, the bad, and the ways to get them working*. [Paper Presentation]. Joint Conference of The Australian Acoustical Society and The Acoustical

Society of New Zealand, Brisbane, Australia.

https://www.acoustics.asn.au/conference_proceedings/AASNZ2016/papers/p147.pdf