SUPPORTING STUDENTS WITH AUTISM SPECTRUM DISORDER IN HIGHER EDUCATION

Supported by the National Centre for Student Equity in Higher Education (NCSEHE) at Curtin University

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ACRONYMS

ASD Autism Spectrum Disorder

AS Asperger's Syndrome

LAP Learning Access Plan

UDL Universal Design for Learning

NDIS National Disability Insurance Scheme

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EXECUTIVE SUMMARY

This project targets improvements in support for higher education students with Autism Spectrum Disorder (ASD) in light of the substantive existing and anticipated future growth of this population, and the failure of existing supports to meet their complex and unique needs.

Uniquely, the research extends existing research in disability supports and pedagogical initiatives to explore the design of the built environment as part of a holistic framework of support for students with ASD in higher education.

The research draws on a review of published literature combined with a cross-sectional analysis of existing supports in Australian institutions and an in-depth analysis of the experience of students at one Australian university to identify key opportunities and gaps in the provision of support for students with ASD.

The key outcomes and recommendations of the research relate to the provision of holistic disability supports, pedagogical innovations, inclusive design solutions and the potential under the National Disability Insurance Scheme (NDIS) for funding to support students with ASD in higher education. These are outlined below.

HOLISTIC DISABILITY SUPPORTS

- The research supports the need to develop comprehensive supports for students with ASD that extend beyond academic skills to include social skills, self-management, advocacy and personal development.
- Peer-mentoring and transition support appear to be effective forms of support but need to be integrated within institutional support structures and maintained across the whole academic pathway. Further research is needed to compare existing programs within Australian higher education institutions and evaluate their success.
- A key gap is the level of awareness of ASD by staff and students. There is a need to develop ASD specific-information, resources and programs to build awareness of the issues experienced by people with ASD, develop skills in supporting students with ASD as staff and peers, and to foster a greater culture of inclusion.

PEDAGOGICAL INNOVATIONS

- The learning styles and needs of students with ASD are diverse – one size does not fit all. Higher education students with ASD should be provided with multiple options for accessing content and engaging in learning experiences. The Universal Design for Learning (UDL) principles may provide a useful pedagogical framework to support students with ASD and the broader population of students.
- Teaching staff have a critical role to play in the wellbeing, academic attainment and retention of students with ASD. Greater awareness of and skills in working with students with ASD for teaching staff is vital.
- Higher education students with ASD should be supported in exercising agency and self-management of their learning. Opportunities include enabling choices in accessing content, supporting individual preferences in location within learning spaces, creating opportunities for structured (rather than forced) social interaction, and optimism regarding each student's potential, emphasising strengths rather than weaknesses.

INCLUSIVE DESIGN SOLUTIONS

- The built environment is a substantial factor in the experience of students with ASD and affects academic performance, social inclusion and health and wellbeing more broadly. Key issues include sensory overload from acoustic and visual stimuli, difficulties navigating campus and online environments, anxiety over forced social interaction and social isolation caused by self-exclusion from campus facilities such as cafeterias and the library.
- Recent developments in the design of new learning spaces as dynamic, interactive, acoustically live and visually stimulating environments, mean that opportunities for retreat to more sensory calming spaces are critical. These need to be easily accessible and adjacent to, or even within, learning spaces. Consideration should be given to the provision of a range of smaller scale spaces distributed across campus to improve choice and accessibility. The design of larger learning spaces, such as lecture theatres, also needs to consider opportunities for discrete escape.
- Consideration needs to be given to the design of social amenities that enable students with ASD to participate in social life on campus, whether actively in smaller social settings, or passively by observing campus activities while being 'hidden from view'.
- Legibility needs to be considered in the design of campus and learning environments so that students with ASD can more readily 'make sense' of the environment. The provision of simple and consistent visual cues can facilitate orientation and navigation in both the physical and online environment.

- Many of the design needs can be met through minor modifications and through the identification and protection of existing spaces that address the needs of students with ASD. However, there are also clear benefits in the provision of a dedicated facility on campus as a 'safe space', particularly to meet the needs of students with medical conditions.
- It is important that issues relating to ASD are embedded in design guidelines to expand inclusive design and accessibility beyond the normative understanding of mobility and physical impairment.

NDIS

- The type and scope of support available to students with ASD in higher education under the NDIS is unclear. Potential opportunities include the provision of expanded peer mentoring support to address the range of academic, communication, independent living, self-management and advocacy skills required by students with ASD. Opportunities also exist to expand transition support to encompass the range of 'micro-transitions' experienced across the entire academic pathway.
- Further research needs to be undertaken to clarify the type of support available to higher education students with ASD under the NDIS. This will require research with a broader range of participants including individuals with ASD who have failed to access higher education despite academic competency and interest, and individuals who have entered higher education, but failed to graduate.

1.0 INTRODUCTION

1.1 BACKGROUND / PROBLEM

Autism Spectrum Disorder (ASD) is a lifelong neurodevelopmental disorder characterised by difficulties in social communication and interaction and restricted or repetitive patterns of behaviour and interests (American Psychiatric Association, 2013). Included in the ASD symptomatology are differences in the processing of sensory information, including hypo- and hyper-sensitivities to environmental stimuli (Bogdashina, 2010). The range in severity and diversity in profile as well as the co-occurrence of a range of other disorders and learnt coping strategies can make diagnosis difficult, particularly if not identified early in life. Intellectual disability is not associated with the disorder, although it can co-occur. Prior to the release of the current Diagnostic and Statistical Manual of Mental Disorders (DSM-5) the term ASD was used as an umbrella term encompassing Autistic Disorder, Asperger's Syndrome[1], and Pervasive Developmental Disorder Not Otherwise Specified (PDD- NOS). However, within the DSM-5 these separate classifications were integrated to form the one diagnostic term of ASD.

Evidence from Australia and overseas indicates that there are increasing numbers of students with ASD undertaking higher education studies (Fleischer, 2012a; Smith, 2007; VanBergeijk & Cavanagh, 2012). However, academic outcomes are often poor, and there is growing awareness of the specific challenges faced by students with ASD (Knott & Taylor, 2014; McLeod & Harrison, 2013; Pillay & Bhat, 2012). Many students with ASD find the higher education learning environment to be 'unpredictable, illogical, noisy and populated with people who communicate unclearly and are unreliable' (Beardon, Martin, & Woolsey, 2009). Support needs therefore are complex, often highly idiosyncratic and at odds with individuals' apparent capacity (Dillon, 2007; Macleod & Green, 2009).

The provision of reasonable adjustments and supports to students with ASD by higher education institutions is mandated by the Disability Standards for Education under the Disability Discrimination Act (Australian Government, 2005). Under this Act students with disability are entitled to participate in education on the same basis as students without disability. Education providers are obligated to consult with students, and make reasonable adjustments accordingly to meet their education needs.

[1] This is variously referred to as Asperger's Syndrome, Asperger's Disorder, Asperger Syndrome, Aspergers or AS.

The traditional academic accommodations provided generally to students with disability often do not address the specific needs of students with ASD and hence there is a need to develop more individualised support services (Dillon, 2007; Ness, 2013; Smith, 2007). The higher education context expects students to be independent, self-motivated autonomous learners (Chown & Beavan, 2012). The characteristics of ASD can cause difficulties that extend beyond academic support to also incorporate aspects of general everyday student life as independent learners (Fleischer, 2012a). In particular, managing everyday routines and fostering social engagement have been identified as two critical areas (Fleischer, 2012a; Glennon, 2001; Knott & Taylor 2014; MacLeod & Green 2009; McLeod & Harrison, 2013; VanBergeijk, Klin & Volkmar, 2008). These types of pastoral care supports often fall outside the scope of supports offered by higher education providers.

Students with ASD have identified the challenges in transitioning to higher education as: social interaction; coping with the learning environment, that is, sensory overload, lack of structure and predictability; and engaging academically (Hastwell, Harding, Martin & Baron-Cohen, 2013a; Knott & Taylor, 2013). Students have expressed academic concerns relating to time management, group work, oral presentations and the need for clear specific directions (Knott & Taylor, 2014). Difficulties with communication and social skills, and associated anxiety can impact on students' ability to establish social relationships and interact effectively with academic staff.

Unfortunately, students with ASD are often reluctant to disclose and seek additional assistance when required, or may decline initial offers of support (Fleischer, 2012a; Knott & Taylor, 2014; Macleod & Green 2009; Pillay & Bhat, 2012). Difficulties in articulating their needs, anxiety about negative labelling and stereotyping, and lack of trust of staff, contribute to this non-disclosure (Ackles, Fields & Skinner, 2013; Fleischer, 2012a; Knott & Taylor, 2014; Macleod & Green, 2009). Students often try to cope; however, when eventually struggling students are identified, academic development, mental health and general wellbeing have already been adversely affected (Macleod & Green, 2009). Hence there is an imperative need to explore how students with ASD can be provided with proactive individualised support services that meet their characteristic needs, and provide them with the same opportunities as other students undertaking higher education studies.

This project builds on and extends existing research focused on supporting higher education students with ASD by integrating two areas of innovation.

First is the impact of the built environment on the experience of students with ASD. There is growing recognition of the importance of the design of the built environment in responding to the diverse 'sensory perceptual worlds' of individuals with ASD (Bogdashina 2003). Despite tertiary education institutions becoming increasingly sensitive to the needs of a diverse student intake in relation to the provision of equitable access to facilities, current guidelines remain restricted to issues of physical

disability including mobility, vision and hearing impairment (see for example Australian Vice Chancellors' Committee (AVCC) *Guidelines for Students with a Disability* 2006). If a holistic framework of support in higher education is to be developed, it must include consideration of the complex inter-relationships between design of the built environment and the sensory experience of students with ASD.

Second, this research considers the constraints and opportunities of the transforming higher education context. Increases in student numbers, academic pressures to prioritise research and the modularisation of the curriculum have been recognised as negatively impacting on the experience of more vulnerable students (Tinkin, Riddell & Wilson 2005 in MacLeod & Green 2009). This will likely be compounded by recent and probable future funding cuts to the higher education sector. Conversely, innovations in online/flexible learning, technologies and pedagogical initiatives have the potential to advance inclusive education practices and enhance students' ability to engage with social support networks (MacLeod, 2010). Computer-based learning may suit the visual processing strengths common to individuals with ASD (Grandin 2006; Rayner, Denholm & Sigafoos 2009), but the non-linear nature of online and blended learning courses and the lack of structure in comparison with traditional on-campus learning practices may prove problematic for some individuals (Downing 2014a, 2014b).

1.2 AIMS AND OBJECTIVES

This project targets improvements in support for higher education students with ASD. It responds to the need for research to explore the unique experiences of this population in order to inform effective, holistic and individualised approaches to student support encompassing disability services, pedagogical initiatives and the design of the built environment.

The research focuses on four key areas – existing supports, needs, resourcing and opportunities – as outlined in the following four research questions:

1.0 What is the scope of existing support provided to students with ASD in Australian higher education institutions?
2.0 What are the experiences and individual needs of higher education students with ASD?
3.0 What opportunities exist to enhance support for students with ASD in higher education?
4.0 What is the potential for funding under the NDIS to support students with ASD in higher education?

1.3 METHODS / SCOPE OF STUDY

The research employs a mixed-methods design in three parts.

1.3.1 LITERATURE REVIEW

Part 1 comprises a review of published literature on disability support and pedagogical strategies for students with ASD in the higher education context and a broader review of literature on the relationship between ASD and the design of the built environment.

1.3.2 SURVEY

Part 2 comprises a cross-sectional analysis of the scope of support currently offered to students with ASD via a questionnaire distributed to disability support practitioners across a representative sample of Australian higher education providers.

1.3.3 SELF-DIRECTED PHOTOGRAPHY

Part 3 provides an in-depth qualitative analysis of the experiences of a small cohort of students with ASD at one higher education institution employing the visual-based research method of self-directed photography.

Together, parts 1-3 provide the context for identifying key gaps in the provision of support and areas of opportunity to enhance existing supports for students with ASD in higher education. Questions of resourcing will then be addressed by considering the opportunities of the NDIS in providing individualised, flexible and ongoing supports in concert with supports offered within the higher education sector.

1.4 STRUCTURE OF REPORT

Chapter 2 provides an overview of the literature in relation to disability supports, pedagogy and the built environment. Given the considerable overlaps between disability supports and pedagogical initiatives to support students with ASD, these are considered together (see Section 2.1). There is a lack of research into built environment factors in relation to ASD, particularly in the context of higher education. This aspect is therefore considered separately and draws on a broader range of literature beyond the post-secondary education context (see Section 2.2). Chapter 3 provides an overview of the research approach and findings from the survey of Australian higher education providers in relation to the scope of support currently offered to students with ASD. Quantitative data from the survey is supplemented by qualitative responses regarding the perceived effectiveness of different supports and

a series of case studies illustrating best practice supports. Chapter 4 provides an overview of the research approach and findings from the self-directed photography study exploring the experiences of students with Autism Spectrum Disorder at the University of Tasmania. Finally, Chapter 5 provides a summary of findings and key conclusions in relation to holistic disability support models, pedagogical innovations and inclusive design solutions.

2.0 REVIEW OF LITERATURE

2.1 PEDAGOGY AND DISABILITY SUPPORTS

This section reviews the literature relating to students with an Autism Spectrum Disorder (ASD) in post-secondary educational settings. It draws on the disability support and education literature to provide an overview of perspectives, recommended approaches, and promising programs.

2.1.1 METHOD OF ARTICLE IDENTIFICATION

An electronic database search of A+ Education and ERIC in May 2015 was conducted using the following search terms: Autism Spectrum Disorder OR Asperger* Syndrome AND Post-secondary education OR University OR College. Additionally, manual searches were carried out on the following journals *Focus on Autism and Other Developmental Disabilities, Journal of Autism and Other Developmental Disorders, Autism Research* and *Autism Insights*. The following search terms were used in the manual searches: university, post-secondary education, and college. Reference lists were also examined for potentially eligible articles. The articles included in this review met the following criteria: (a) published in English, (b) published in journals that implement a peer-review or editorial process involving academics and practitioners; and (c) focused on the post-secondary education of students with Autism Spectrum Disorder (ASD) (inclusive of Asperger's Syndrome). The title and abstract were screened for inclusion criteria. If in doubt as to the eligibility of an article based on the title and abstract, the article was read further until the eligibility of the article was clear. Additionally, the reference lists of articles were screened to identify any potentially relevant articles. The majority of excluded articles were either in relation to primary and secondary school students with ASD, or one or more of the search terms were in the articles incidentally.

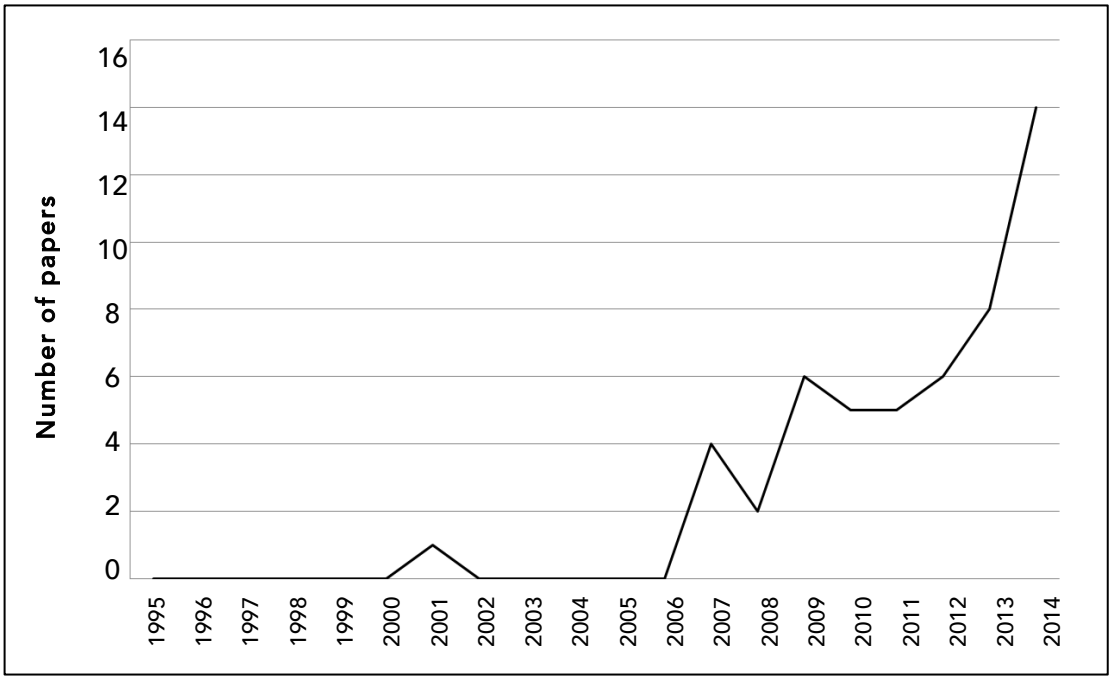
2.1.2 FINDINGS

GENERAL CHARACTERISTICS

A total of 53 papers was identified through the above process. Of these papers, 14 (26%) were published in 2014. Indeed, the chronological spread of papers identified suggests a growing interest in the needs of higher education students with ASD (see Figure 1). Nearly two-thirds of papers (35 papers,

66%) were by authors from the USA, with 11 (21%) from the United Kingdom, 3 (6%) from Australia, 2 (4%) from Canada, and 2 (4%) from Sweden.

Figure 1: Graph showing the number of papers by year.



(Note: although two papers from 2015 were included in this review, data for this year is not included here because it is incomplete.)

The papers can be conceptualised as fitting into four broad categories of publication type: (a) *Descriptive studies* (22 or 41%), where qualitative and/or quantitative research methods were used to explore the experiences of and supports for current (or future) higher education students with ASD without manipulating or assessing causation; (b) *Discussion papers* (16 or 30%), in which professional experience, anecdotal observations, and informal analyses of the literature provided the basis for comment on and recommendations in relation to current (or future) higher education students with ASD; (c) *Program evaluations* (11 or 21%), in which feedback on a program or data on an intervention for current (or future) higher education students with ASD was reported; and (d) *Literature reviews* (4 or 8%), in which an analysis of previously published literature regarding current (or future) higher education students with ASD formed the basis of the paper's content. The relative frequency of these publication types is illustrative of the state and growth of the literature on higher education for students with ASD, and all types make an important contribution to knowledge in this field. A summary and thematic analysis of papers according to their publication types follows.

DESCRIPTIVE STUDIES

Overview

Descriptive studies have helped identify the issues and explore the perspectives of various stakeholders in relation to higher education for students with ASD. These studies have ranged in their sample sizes from one (Downing, 2014a, 2014b) to 920 (Wei, Christiano, Yu, Blackorby, Shattuck, & Newman, 2014) with the size and characteristics of the sample often representing a limitation in the individual studies. Twelve of the 22 papers reported on the perspective of individuals with ASD (including Asperger's Syndrome). Other perspectives included peers and other students (e.g. Nevill & White, 2011), parents (e.g. Morrison, Sansosti, & Hadley, 2009), faculty members (e.g. Gobbo & Shmulsky, 2014), and institutional representatives (e.g. Barnhill, 2014).

Supports

Key recommendations in terms of supports included the need for early and explicit transition planning (e.g. Chiang, Cheung, Hickson, Xiang, & Tsai; 2012;), collaborative and tailored (flexible) approaches to service provision (e.g. Camarena & Sarigiani, 2009; Fleischer, 2012a; 2012b) and professional learning for disability support practitioners and faculty members (e.g. Knott & Taylor; 2013; McKeon, Alpern, & Zager; 2013; Morrison, Sansosti, & Hadley; 2009). The need for support extending beyond academic skills (i.e. including social, communication, independent-living, self-management, and advocacy skills) was emphasised (e.g. Knott & Taylor, 2013). The importance of acceptance from peers (e.g. Gardiner & Larocci, 2014) and the promise of approaches that involve peers (i.e. peer mentoring programs) (e.g. Barnhill, 2014; Matthews, Ly & Goldberg, 2015) were key features of the findings and recommendations of these descriptive studies. One potential disagreement was in relation to whether tailored support services (e.g. Longtin, 2014b) or enhancement of existing general support services (e.g. Smith, 2007) represented the ideal way forward. In either case, a shared message was the need for the provision of professional learning for service providers and faculty members.

Pedagogy

In terms of learning and teaching practices (i.e. 'pedagogy'), these descriptive studies collectively reinforced the need for students with ASD to be provided with clear communication (including expectations and feedback), consistent adherence to routines and rules, and to be given access to learning environments that attend to the emotional climate and respect their sensory processing characteristics (e.g. less visual and auditory 'noise') (e.g. Hastwell et al. 2013a; Madriaga & Goodley, 2009; McKeon, Alpern, & Zager, 2013). The need for faculty members to provide targeted support for students with ASD in developing critical thinking skills (such as in navigating open-ended tasks and problem-based learning scenarios) and in working within collaborative learning contexts (such as for

group assignments) was also highlighted (e.g. Downing 2014a, 2014b; Gobbo & Shmulsky, 2014). Developments in catering for students with ASD were also seen as part of a more general move to greater inclusion in higher education, where diversity is not just tolerated, but valued (Beardon et al., 2009).

DISCUSSION PAPERS

Overview

Discussion papers draw on the eclectic experiences, expertise, and engagement in the literature of the authors to provide valid opinions, perspectives, and future direction for higher education and students with ASD. As with the number of descriptive studies compared with program (or intervention) studies, that 30% of the papers included in this review can be viewed as discussion papers is in keeping with the view that the field of higher education for students with ASD represents a relatively new but increasingly important focus. Four of the 16 papers targeted transitions from secondary education, recommending a continuity of support and the development of students' self-awareness and self-advocacy skills, as well as reinforcing the need for collaborative multi-disciplinary support services. In this context, the role of a 'mentor' was encouraged. Indeed, among the discussion papers collectively, the role of mentors (particularly peer mentors) was explored and promoted on several occasions (e.g. Ackles, Fields, & Skinner, 2013; Dillon, 2007; Glennon, 2001; Hart, Grigal, & Weir, 2010; and Pillay & Bhat, 2012).

Supports

The discussion papers included articles that explored general issues, emphasising students' holistic and comprehensive support needs in the transition to higher education (e.g. Hewitt, 2011; Roberts, 2010) as well as the need for systemic responses involving policy development and adequate funding allocation (e.g. Hart, Grigal, & Weir; 2010; & VanBergeijk, Klin, & Volkmar, 2008). More specific approaches to support included the use of social cognitive career therapy (SCCT) which was argued to be particularly suited to college students with Asperger's Syndrome (Mynatt, Gibbons, & Hughes, 2014).

Pedagogy

Pedagogical considerations were discussed in several of the articles, such as the recommendations for teaching critical thinking skills, supportive executive function, and minimising classroom anxiety from Shmulsky & Gobbo (2013). Universal Design for Learning (UDL) was also promoted (Hart, Grigal, & Weir, 2010; Taylor & Colvin, 2013). UDL principles inform learning and teaching experiences with multiple means of representing information/content, multiple means of action and expression in the learning

process, and multiple means of engagement (Taylor & Colvin, 2013). Taylor & Colvin (2013) suggested that in addition to promoting the engagement and achievement of students with Asperger's Syndrome, the use of UDL principles would also assist in catering for student diversity more generally.

PROGRAM EVALUATIONS

Overview

Program evaluation articles included those reporting on multi-component service delivery models, peer mentoring/support initiatives, and skills development courses. The distinction between these approaches is more conceptual rather than actual, and there was considerable overlap. For example, most (if not all) of the programs aimed to provide information, to serve as a point of reference for accessing relevant services, and to develop students' capacities to study and live in higher education contexts. The categories in which the programs are discussed below are thus based on distinctions of emphasis.

Multi-component service delivery models

As suggested by authors of the descriptive studies and discussion papers, there are merits in providing comprehensive, multi-component services and programs to support students with ASD in higher education. A limitation of the research on these programs and services, however, is that it is difficult to isolate their outcomes to particular aspects and infer causal relationships between specific variables.

Hagner, Kurtz, Cloutier, Arakelian, Brucker, & May (2012) reported that an intervention program consisting of group training for families, person-centred planning meetings, and follow up assistance led to improvements in student and parent expectations, self-determination, and vocational decision-making ability for the participating youth with ASD. Zager & Alpern (2010) described the Campus-Based Inclusion Model (CBIM), which has been part of Pace University's approach to transition support. Specifically, the CBIM aims to develop social communication skills for students through a tailored process of standardised assessment, naturalistic observations, and self-efficacy perceptions facilitated by weekly group and individual sessions. The authors reported that this approach has been found to be beneficial for successive cohorts of students with ASD, as the program has been refined over a period of five years.

MacLeod & Green (2009) reported on a collaborative service delivery model, implemented at Birmingham University. The collaborative partners were the university-based 'Disability Team' (for all university students with a disability) and the community-based 'Support Team' (established by parents of adults with ASD). The collaboration was initially fostered as a reaction to the needs of a particular

student, but the authors supported a more proactive and holistic strategy. Linking the capacity for the Disability Team to identify and monitor students with ASD with the ability of the Support Team to provide specialist, tailored interventions to address individual needs was seen as the strength of this approach.

The University of Reading's comprehensive support strategy included a diagnostic clinic (accessed through referral) and information service (Taylor & Knott, 2007). It also involved students diagnosed with ASD being assigned to a keyworker (staff member), an academic mentor (peers, postgraduate students), and a social mentor. Parents were also involved where possible, especially at the transition to university and early stages of study, alerting the keyworker to issues as relevant. Taylor and Knott (2007) suggested that assistance in the diagnostic process together with coordinated support following diagnosis has been helpful for the students with ASD.

The Interdisciplinary Collaborative Support Services program (Longtin, 2014a), involving six college offices, included a resource library and in-service training for staff and students. Its central initiative, however, was a mentoring arrangement between students with ASD (mentees) and graduate students in Mental Health Counselling, School Counselling, and Speech-Language Pathology courses (mentors) who undertook a ten-week training process. As well as facilitating referral to relevant services, the weekly individual mentee/mentor meetings provided opportunities for advice and support in relation to 'college life, social pragmatics, executive function, study habits, relationship building, job search, and self-advocacy' (p. 334). Although timing was a challenge and ongoing sustainability relied on funding decisions, Longtin (2014a) reported that the Interdisciplinary Collaborative Support Services program was, on the whole, viewed positively by participants and stakeholders.

Mentoring programs

In addition to Longtin (2014a), two articles reported specifically on mentoring programs (Ames, McMorris, Alli, & Bebko; 2015; Ness, 2013). The ASD Mentorship Program (AMP) at York University aimed for students with ASD to 'feel a sense of belonging within the academic and social setting of university life' (Ames et al. 2015, p. 3). Students with ASD (mentees) were paired with a graduate student in the clinical psychology program (mentors) under the supervision of a clinical psychologist. The program consisted primarily of individual meetings with the mentor and group events (social or workshop-based). The increase of students opting into the program (200% over four years) and the positive feedback from participants were testament to the success of the AMP.

As part of the 'Strategies for College Learning' (SCL) model, students with ASD (mentees) were paired with volunteer students enrolled in a course on communication sciences and disorders (mentors). The mentors received specialist training and instruction from faculty members who were experts in this

clinical field (Ness, 2013). The SCL involved mentees and mentors working together to develop the mentee's self-regulation strategies through 10 or 11 one-hour sessions structured into the four components of: assessment, goal setting, strategy instruction, and self-monitoring. All participants acquired new and personally relevant self-regulation skills in order to more effectively manage their study life.

Accepting that these mentoring programs reflect differences in context, content, and delivery mode, they seem to share the following characteristics: (1) students with ASD who disclose their diagnosis and opt into the support program; (2) students who are enrolled in relevant courses who have an interest in providing support and knowledge about ASD; and (3) expert staff members who provide training, supervision, and support for the mentors (and mentees), and maintain oversight of the program. These may be critical variables for the successful implementation of mentoring programs, highlighting the kinds of conditions and supports surrounding the mentee-mentor relationship that make them more likely to succeed.

Although not explicitly understood as mentoring, the 'Participation Assistant' approach for supporting students with ASD with study and life at Australian National University described by McLeod and Harrison (2013) shared the three of these general characteristics of mentoring programs outlined above. All students who disclosed a diagnosis of ASD were offered the support of a Participation Assistant (casually employed psychology or medical students) who functioned under the oversight of the Disability Advisor. Up to five hours per week was provided by the Participation Assistant to assist with physical and technological orientation, time management, adjustment to the social and independent living requirements, and liaison with relevant faculty and support services. McLeod and Harrison (2013) reported that the approach has been successful, is expanding, and is being enhanced through further professional learning for staff.

Peer support network

The online peer support network at the University of Birmingham (MacLeod, 2010) was an innovative use of a learning management system to provide information, connect students with services, and connect students with each other. Although the peer-to-peer nature of the approach differs from mentoring arrangements, it does share the characteristics of an opt-in process for students with ASD and the oversight of a staff member with relevant expertise. According to MacLeod (2013), the network was successful in fostering peer support despite some limitations in the functionality and design of the platform.

Skills development courses

Pugliese & White (2014) reported on the 'Problem Solving Skills: 101' intervention program, which used a cognitive-behavioural therapy approach for college students with ASD. The program involved nine 90 minute group sessions led by two advanced clinical psychology doctoral students. Sessions focused on topics such as recognising problems, attitudes towards 'problems,' regulating negative emotions, problem solving processes and strategies, self-monitoring, and problem solving implementation and evaluation. 'Consumer satisfaction' data was positive, while treatment efficacy data was inconclusive, with two of the five demonstrating significant improvements in measures of problem-solving ability and symptom distress.

In comparison to the clinical, targeted approach evident in the 'Problem Solving Skills: 101' intervention program, the first year course for students with ASD at the University of Connecticut, described by Wenzel and Rowley (2010), was more embedded into the support services and academic offerings of the institution. A close collaboration with the First Year Programs Office facilitated relevant students' enrolment into the course, consisting of fourteen classes that sought to address the needs of those new to university in addition to the specific considerations relevant to life with ASD. As well as leading to positive outcomes for students with ASD, the authors suggest that this approach was an efficient way for disability service staff to connect with the students and provide comprehensive instruction to assist in their study and life at university.

Literature reviews

With the specificity of individual studies in relation to their context, dependent variables, and independent variable, literature reviews play an important role in synthesising research on this topic and evaluating the evidence base upon which specific supports are provided (Gelbar, Smith, & Reichow, 2014). Two of the four literature reviews identified here focused on transitions to higher education. Hendricks & Wehman (2009) reviewed research on individuals with ASD moving into a range of post-secondary education pathways, and provided a summary of recommendations in relation to their school, home, work, and community. As well as recommending early transition planning in schools, they suggested that a minority of students with ASD is entering higher education and that further research is needed to determine best practices. Based on other findings of this environmental scan, we would note that individuals with ASD represent an important, growing population of higher education students and echo the call for further research.

Zeedyk, Tipton, & Blacher (2014) explored the literature on post-secondary school transitions, with a focus on the relative benefits of pathways into 2 year and 4 year colleges. This focus clearly has particular relevance for the USA, but other recommendations by the authors have more general

applicability. For example, the importance of students disclosing an ASD diagnosis reinforces the view of Taylor and Knott (2007) that this improves opportunities for, and outcomes from, support.

Twenty studies reporting on the experiences of, and supports for higher education students with ASD were reviewed by Gelbar, Smith & Reichow (2014). The academic accommodations and supports included modifications to assessment (e.g. location, time), provision of lecture notes (from lecturers and peers), and flexibility with group-based activities (e.g. option to undertake individual rather than group assignment, and one-to-one presentation rather than presentation to a larger group) (p. 2598). They found that the main form of non-academic support involved peer mentorship programs, followed by individual studies on parental involvement, social stories (brief, often illustrated, descriptions of real life situations that support the development of social understanding for people with ASD) video modelling, and cognitive behavioural interventions (p. 2598-2599). Gelbar, Smith & Reichow (2014) argued that there remained a scarcity of research on which to base services and interventions.

Chown & Beavan (2011) provided a more fluid (less systematic) review of the literature for students with ASD in higher education, also drawing on cases in the UK context. They proposed the 'Maturity model for evaluating autism service provision in colleges of further education' (p. 492), which draws attention to institutional characteristics including: (a) senior management commitment, (b) student data management, (c) student induction, (d) student support and training, (e) staff training, (f) student progression, (g) partnership working, and (h) environment (sensory sensitivities). Together with directives for further research into the prevalence of, barriers experienced by, and achievement of students in higher education, they argued that progress in supporting students with autism is also likely to benefit all students.

2.1.3 SUMMARY AND DISCUSSION

Characteristic strengths of individuals with autism in relation to study at the tertiary level include a passion for particular fields of interest and the ability to adhere to institutional rules (Gobbo & Shmulsky, 2014). But completion of secondary schooling and high intellectual quotient (IQ) will not necessarily equate to success in higher education for students with ASD (Gelbar, Smith & Reichow, 2014). Accepting that there were some differences of opinion as to whether unique support services or enhancement of current support infrastructure were the ideal way forward (compare Smith, 2007 and Longtin, 2014b), and considering the different contexts and approaches represented, a striking feature of the articles explored here was the consistent and complementary nature of recommendations regarding supports and pedagogy for students with ASD.

Collaborative (Ackles, Fields, & Skinner, 2013; Dillon, 2007), multi-disciplinary (Dipeolu, Storlie, & Johnson, 2014), and holistic approaches (Longtin, 2014b) to support were recommended. Creating awareness of the diagnosis (Taylor & Knott, 2007; Zeedyk, Tipton, & Blacher, 2014), promoting acceptance of students with ASD (Gardiner & Larocci, 2014), involving peers (Gardiner & Larocci, 2014; Glennon, 2001), and the provision of professional learning for staff (Knott & Taylor; 2014; McKeon, Alpern, & Zager; 2013; Morrison, Sansosti, & Hadley; 2009) were encouraged.

The importance of developing students' social, communication, and self-advocacy skills (Camarena & Sarigiani, 2009), as well as academic skills (Knott & Taylor, 2014), was highlighted. Faculty were advised to employ pedagogies characterised by clear instructions and an awareness of students' sensory processing characteristics (Hastwell, Harding, Martin, & Baron-Cohen, 2013b), as well as flexible learning design (Hart, Grigal, & Weir, 2010; & Taylor & Colvin, 2013). The importance of providing assistance for students in developing critical thinking skills (Shmulsky & Gobbo, 2013), managing open-ended tasks (Downing, 2014a), and negotiating collaborative learning experiences (Madriaga & Goodley, 2009) was also noted. The supports and pedagogies promoted for students with ASD should be seen in the context of catering for and valuing student diversity in higher education more generally (Beardon et al. 2009; Taylor & Colvin, 2013).

All programs evaluated were reported to be beneficial, at least to some extent. This is encouraging, as the literature identified here describes a range of approaches worthy of consideration. In some cases, the positive reports should be understood with caution, noting that methodological issues of some studies represent limitations in terms of the internal reliability and generality of the findings. Further research in relation to support and pedagogy for higher education students with ASD is warranted because the relative level of empirical support for the various programs and interventions, as well as their applicability across contexts, remains unclear.

A number of papers explored and made recommendations for transitions to university study and life. Future research may examine whether there is a need for services to support students transitioning from higher education settings into employment or between higher education settings. Also, while some papers identified here made mention of students' sensory processing characteristics in the context of their learning, considering the diagnostic characteristic relating to hyper- or hypo-reactivity to sensory input, few studies have explored the broader impact of the sensory and physical environment for higher education students with ASD.

2.2 BUILT ENVIRONMENT

The impact of the diverse sensory processing characteristics of students with ASD is a key component of this research in relation to the relationship between the built environment and the experiences and support needs of students in higher education. Given the scarcity of research in this area we draw on a diverse body of literature to provide an overview of key issues and current knowledge of best practice in relation to design strategies and guidelines before discussing issues and opportunities in relation to the post-secondary education context.

2.2.1 METHOD OF ARTICLE IDENTIFICATION

An electronic database search of Google Scholar, Avery Index, ProQuest, Scopus and JStor was conducted in May 2015 using the following search terms:
Autism OR ASD OR Asperger* AND design OR 'built environment' OR architecture. Specific searches were also conducted using these terms in combination with university OR 'higher education' as well as 'universal design'. Reference lists were also examined for potentially eligible articles.

54 relevant articles were found under these search terms, falling into 3 broad categories: design of the built environment in relation to people with ASD (28 articles), the higher education experience for those with ASD (15) and articles dealing with ASD and sensory issues related to the built environment (8).

2.2.2 FINDINGS

KEY ISSUES IN RELATION TO ASD AND THE BUILT

A review of the literature on the relationship between ASD and the built environment raises several key issues that differentiate the experience of individuals with ASD in comparison with the neuro-typical experience. These issues are largely a consequence of the ways in which individuals with ASD perceive and make sense of their physical environment. Their spatial experience and the ways in which they interact with their physical environment are influenced both by characteristic behaviour traits and a particular way of sense-making (Baumers & Heylighen, 2010b). Issues of hyper- or hypo-sensitivities to sensory input, difficulties in orientation and way-finding, and heightened reliance on predictability and order influence both their perception of, and interaction with, the built environment (Bogdashina, 2003; Mostafa, 2008; Davidson, 2010; Baumers & Heylighen, 2010a,b; Sánchez, Vázquez & Serrano, 2011).

Sensory issues

As Baumers & Heylighen (2010b, p.8) point out, '[a] first analysis of the considered descriptions of the built environment by people with autism reveals a characteristic way of perceiving.' Individuals with ASD may have difficulties with sensory stimuli, both in integrating competing inputs from different senses, and in exhibiting hyper- or hypo-sensitivities to sensory inputs (Grandin, 2006; Dunn, Myles & Orr, 2002; Bogdashina, 2003; Myles, Dunn, Rinner, Reese, Huggins & Becker, 2004; Davidson, 2010). Individuals with ASD may also experience sensitivities to acoustics, lighting, colour, texture, touch or smells. Mostafa (2008), in her research with young children with autism, found that acoustics were the most influential factor in children's reactions in certain spaces. Reducing auditory stimuli aided concentration and decreased anxiety. This is supported by a study of learning environments on the behavior of students with ASD in relation to multiple environmental stimuli which concluded that 'the design of the learning environment through space organization, lighting, color, and noise control has an effect on behavior of students with ASD' (Gaines, Curry, Shroyer & Amor, 2010, p.392).

Bogdashina (2003) describes the multiple stimuli that can assail a person with ASD as 'sensory pollution'. Even an apparently calm quiet room can be overwhelming to someone with ASD as they may not be able to adjust to the sensory assaults that neuro-typical individuals accept as normal, filter out, or don't even register. Such distracting or intolerable stimuli may include flickering or buzzing fluorescent lighting, bright beams of sunlight, ticking clocks, humming fans, passing footsteps, distant traffic… any or all of which may require simultaneous, but individual, processing. An analysis of ASD authors' explanations of their own sensory experiences reveal that multiple inputs from various senses do not, as with neuro-typical individuals, combine to provide an understanding of the larger perceptual picture, but instead create a jumbled amalgam of parts from which little sense can be made (Davidson & Henderson, 2010, p.467).

Navigation, way-finding and transitions

Research has identified that sensory sensitivities and difficulties with modulating or processing sensory information may also contribute to the particular ways in which individuals with ASD react to, organise and make sense of space. Key issues include problems with navigating and way-finding – even in well-known environments, the reliance on order and predictability, and difficulties dealing with transitions (both spatial and temporal). Baumers & Heylighen (2010b) highlight orientation and way-finding as a recurring problem for individuals with ASD, in part due to their difficulty in developing a general concept of the overall environment, and in imagining what is not present – the 'hidden logic associated with space' (Baumers & Heylighen, 2010a, n.p.). Sensory processing difficulties may also contribute to navigational confusion, as '…when moving from one space to another it is not a question of getting lost but rather a question of being distracted along the way' (Mostafa, 2008, p.205). In some cases way-finding and orientation for individuals with ASD in institutional settings has been assisted with the use of

sensory zoning and visual cues, supported by findings such as those of Mostafa (2008) and Davidson & Henderson (2010) that individuals with ASD may identify and make sense of the architectural and spatial environment through 'sensory mapping' rather than functional zoning.

For individuals with ASD the spaces themselves also need to be consistent and clearly delineated, with obvious clues as to their purpose (Sánchez, Vázquez & Serrano, 2011). Multi-use spaces are confusing. Their research also notes that, in their struggle to imagine and anticipate certain situations, individuals with ASD require environments to be predictable. This is supported by literature suggesting that transitions between spaces may also become an obstacle unless they are transparent and allow individuals a preview before moving into a new space (Ahrentzen & Steele, 2009; Kinnear, Baumers & Heylighen, 2014). The requirement for spaces to be consistent, transparent and clearly delineated is reinforced by observations that, for people with ASD, aspects of physical space – the tangible and directly experienced – 'seem to inspire more confidence than human beings' (Baumers & Heylinghen, 2010a, n.p.). As others have pointed out, however, dependence on the predictability and constancy of physical space, and on routines of navigation, creates greater difficulties for individuals with ASD when change occurs. Orientation and sense of direction is maintained only if familiar markers or environments remain *exactly* the same. Slight detail changes can alter the whole, creating a new, unfamiliar, scene that may result in confusion and disorientation (Bogdashina, 2003; Davidson & Henderson, 2010).

The implications of spatial variation – and the need for withdrawal spaces

Several authors point out that sensory sensitivities and the need for predictability may also result in individuals with ASD seeking alternative 'escape' spaces (Mostafa, 2008; Baumers & Heylighen, 2010a,b; Pillay & Bhat, 2012;). Although such withdrawal or self-isolation may be perceived as 'odd', or even abnormal, behaviour by neuro-typical others, Davidson & Henderson (2010, p.465) point out that, in the face of a sensorily confusing and overwhelming environment, withdrawing to a space where '…perceptual rest and regrouping can take place…' makes sense. 'Escape' spaces typically have reduced stimuli, are clearly delineated and always accessible. Such spaces may be formalised, or particular to the individual, and may often be outdoor areas where it is possible to connect with nature. Individuals with ASD may '…seek comfort in tangible space rather than with other human beings… as a safety point amidst an incomprehensible society…' (Baumers & Heylighen, 2010b, pp.4-5). ASD authors themselves have also identified the natural environment, and interaction with non-human beings, as offering respite from the disruptions and intrusions of an overpowering social world (Davidson & Smith, 2009). Even the knowledge that a calm 'escape' space is available, whether or not it is used, may be enough to support some individuals in coping with difficult sensory spaces (Mostafa, 2008).

Sensory sensitivities can also lead to the avoidance of particular spaces perceived as uncomfortable or threatening by individuals with ASD. In Gaines' 2010 study, special education teachers most often

identified large open spaces – e.g. playgrounds, cafeterias and gyms – as potential sensory problem areas (Gaines et al., 2010). In an empirical study (Hill, 2014) exploring the lived experience of mainstream secondary school students with ASD, students contrasted their calm, relaxing support base with the crowded, noisy and confusing playground and canteen. In terms of tertiary education, this manifests in difficulties accessing, or tolerating, spaces that promote (neuro-typical) student congregation and social interaction. Sensory barriers to these places – such as cafeterias, student unions and libraries – further isolate students with ASD already struggling to engage socially in university life (Madriaga, 2010).

However, as is common with many aspects of ASD, there are variations between individuals, and across the spectrum. As pointed to in much of the literature (Grandin, 2006; Baumers & Heylighen, 2010b; Henry, 2011b; Vázquez & Torres, 2013; Kinnear et al., 2014), there are complexities and contradictions in these variations. While some individuals with ASD are most comfortable in the structure and control offered by small, subdivided spaces others may feel threatened in small spaces where they are forced into closer proximity with others. And though other individuals with ASD prefer large, open areas that allow for predictability and control through overview, and the avoidance of dark corners, many become anxious in large, complex spaces.

Strategies and guidelines for design and ASD

In terms of the built environment, despite growing recognition of the importance of design in responding to the diverse 'sensory perceptual worlds' of individuals with ASD (Bogdashina 2003), the pervading bias towards physical/mobility disabilities, in terms of both access legislation and design standards, has meant that '…autism is by and large ignored by the architectural community, excluded from building codes and guidelines, even those developed specifically for special needs individuals' (Mostafa, 2008, p.191).

There are large gaps in current disability access and design legislation. In the UK, the 2005 DDA [Disability Discrimination Act] Amendment requires the elimination of discrimination based on disability in higher education institutions, but – in what is referred to by Madriaga (2010, p. 48) as 'base level thinking' – has resulted in minimum provision support for disabled students, rather than best practice. In the US, gaps in legislative guidelines are compounded by inconsistencies in identifying disability in education between the K-12 and post–secondary sectors (Lovett, Nelson & Lindstrom, 2015). The IDEA [Individuals with Disabilities Education Act], applicable to the K–12 sector, is designed to increase academic 'success' in students with special needs, but the ADA [Americans With Disabilities Act] applicable to post-secondary students, aims for increased 'access', regardless of the ultimate academic outcome.

In Australia, legislation including *Disability Standards for Education* [2005] (formulated under the *Disability Discrimination Act* 1992 [DDA] and applicable to all education sectors – K-adult) guides access and building standards. The former includes in its definition of disability '…a disorder or malfunction that results in the person learning differently from a person without the disorder or malfunction…[or]…that affects a person's thought processes [or] perception of reality…' (Sect. 1.4). While this could encompass ASD, in practice the resultant access guidelines and standards, including the universities' AVCC [Australian Vice Chancellors' Committee] *Guidelines relating to Students with a Disability* (2006), formulated in response to the 2005 legislation, are very much focussed on mobility and physical access issues in their consideration of the built environment. For example the only substantive mention of the built environment in the AVCC *Guidelines* is in terms of avoiding discrimination due to physical access difficulties (Section 5.2), and consideration of alternative signage and information, such as large print and Braille, to '…facilitate access by all students…' (Section 5.3).

Several authors point out that the bias in built environment guidelines towards physical disability, and the relative lack of consideration of barriers for those with cognitive or mental disabilities may be partly due to the non-standard or idiosyncratic needs of such individuals (Mostafa, 2008; Sánchez et al., 2011; Pillay & Bhat, 2012). But it is somewhat ironic, as Mostafa notes in her later work, '… that accessibility codes, whose raison d'etre is to ensure inclusion of individuals with special needs in all built environments, are … themselves non-inclusive.' (2013, p.4)

This difficulty in providing for specific needs that are not always immediately identifiable is echoed in the literature from some architects and ASD professionals (albeit mainly those involved with institutional facilities) – with discussion and debate as to the merits of designing specific ASD-friendly environments versus providing individuals with ASD with the skills to cope with a neuro-typical environment. On the one hand, there is the contention that accommodating sensory sensitivities by keeping the sensory environment as 'clean' as possible would make the world a much more acceptable place for those on the autism spectrum (Bogdashina, 2003), and that altering the sensory environment of the architectural surroundings can favourably influence autistic behaviour (Mostafa, 2008). But this is contrasted by arguments that such sensory sensitive environments hinder, rather than improve, ASD students' ability to integrate into the wider world due to their poor generalisation skills (Henry, 2011a), and that the provision of alternative quiet places with low stimuli for students with ASD 'express tendencies to segregate students with AS rather than getting them socially engaged into student life…' (Madriaga, 2010, p.47). However, Henry (2011a, p13), also asks rhetorically 'Should individuals with disabilities be required to habituate themselves to the 'typical' standard if they want access and acceptance into the larger society?' – and equates this with architects forcing those with mobility difficulties to navigate stairs without ramps or lifts.

ASD and the built environment in the higher education context

Despite the recognised difficulties of students with ASD in post-secondary education and the impact of the built environment on the learning experience, there is very little in the literature specifically targeting ASD and the built environment in the higher education context. Several studies have specifically examined the experiences of such students in higher education settings (Martin, 2006; Beardon et al., 2009; Hastwell et al., 2013a, 2013b; Mischenko, 2013; Redpath et al., 2013), including a number which have quite detailed qualitative data based on interviews with the students themselves, but are limited to very small numbers of participants (Madriaga, 2010; Fleischer, 2012a; Knott & Taylor, 2014). However, throughout the literature there are surprisingly few mentions of the built environment and its influence on, or design for, students with ASD.

Martin's 2006 report on a study investigating the support available for students with Asperger's Syndrome in higher education in the UK was based on responses from 8 students and 170 staff, over 15 universities. Despite its stated intention to propose recommendations for '…making the [HE] environment less disabling for individuals with AS…' (Martin, 2006, p.2), the physical or built environment is only mentioned indirectly (and not further analysed) in statements such as '[h]eightened sensory perception may make some ordinary situations, like using the refectory, seem unbearably stimulating' (p.9). The Asperger Syndrome Student Project, 2009-12, based at Cambridge University, included a longitudinal study of the experiences of 28 students with AS over 3 years of their higher education studies. Part of the stated objectives was to '…identify what works and where improvements are needed…' by making sure that '…the student's voice is centre stage and that the outcomes of the project are of practical benefit to students with AS' (Hastwell et al., 2013a, p.5). Despite the wealth of qualitative data collected by the study, there remains a focus on academic and study support with little mention of the influence of the physical environment beyond general, unexamined statements such as: 'Sensory overload can increase anxiety and make it very hard for the student to study or relax' (Appendix 1, vii). Similarly, Beardon et al. (2009) used questionnaires completed by 238 adults with AS/HFA to examine the challenges, and the support available, at college and university, but makes almost no mention of built environment apart from a short paragraph on sensory hyper/hypo-sensitivities.

Most literature dealing *specifically* with the design of the built environment for individuals with ASD is focused on either educational settings for younger children (see for example Beaver, 2006; Mostafa 2008, Henry 2011b; and Mostafa's 2014 publication outlining of the development of her Autism ASPECTSS™ Design Index for Schools and residential homes for children with autism), or adult independent housing (see Ahrentzen & Steele, 2009; Brand 2010; Myers & Associates, 2010). Some issues *have* been identified in relation to higher education students, including the problems of noise and overcrowding – particularly in relation to halls of residence (Knott & Taylor 2014) and examination

centres (VanBergeijk, Klin & Volkmar 2008), and the problems of social isolation stemming from the inaccessibility of the student union and library due to heightened sensitivity to environmental stimuli (Madriaga, 2010). However, Sánchez et al. (2011) – in 'Autism and the Built Environment', an extensive review of key literature in the field since the 1970s – conclude '… that the literature on built environments and their relation to people with ASD and their needs is scarce, in spite of the enormous amount of research on autism that has been carried out in recent years.' (p. 378)

This is not to say that students with ASD, and those in higher education settings in particular, have few issues related to the built environment or that the built environment has little effect on the experience of such students, but rather that it has not been fully studied, or that in the more extensive qualitative studies it has not been directly addressed. Madriaga (2010) found that, in their personal narratives, more than half of her respondents (albeit in a small-scale study with 8 students) mentioned issues regarding the 'inaccessibility' of places such as libraries, student union pubs and orientation activities due to their sensory hypersensitivities, and Adreon & Durocher (2007) detail several issues with the design of dorm accommodation for students with ASD. Significantly, though, Knott & Taylor (2014, p.423) note – in their research involving both higher education students with ASD and the university staff members involved in supporting them – that '[s]tudents described the impact of sensory issues, but these were rarely mentioned by staff, even after prompting…', going on to point out that this is '… particularly surprising given that sensory issues are a well-recognised phenomenon in AS … and yet, staff seemed unaware of their impact.'

2.2.3 SUMMARY AND DISCUSSION

Although rarely explicitly identified as a factor impacting the experience of students with ASD in higher education, it is clear that the built environment has a key role to play in enabling or constraining access to higher education. In particular, sensory sensitivities can cause anxiety, diminished academic functioning and even self-exclusion from certain environments. This is compounded by the difficulties experienced in making sense of and navigating the built environment leading to senses of disorientation. Without formal recognition of the difficulties experienced by individuals with ASD in legislation and guidelines and in the absence of broad awareness of these issues, the disadvantages experienced by students with ASD in higher education will remain invisible.

3.0 EXISTING SUPPORTS

3.1 OVERVIEW OF AUSTRALIAN CONTEXT

The enablement of the Disability Standards in Australian Higher Education institutions typically occurs through the designated role of a Disability Practitioner. This role has responsibility for consulting with students with disability in order to ascertain the necessary reasonable adjustments to allow for participation on the same basis as other students. It encompasses assisting students to identify the impact of their disability on their studies, consulting with academic staff regarding inclusive teaching practices, facilitating linkages to other support staff, and supporting access to assistive technology and interpretation services. Particulars of the study and assessment adjustments, and specialist services provided by the institution to a student with disability are documented through an individualised Learning Access Plan (LAP).

Although there is no consistent approach in the LAP process there are a number of fundamental principles that should underpin their development and distribution (ADCET, 2015). These include consultation with the student in the formation and review of the plan, and student consent for its dissemination to appropriate and relevant staff.

Australian universities are able to claim additional funding to support students with disability from the Commonwealth Government. ASSD (Students with Disabilities) funding assists with the costs incurred in providing learning support and/or equipment to students with disabilities, to enable them to participate in higher education.

The current study investigated the scope of supports provided to students with ASD across higher education institutions within Australia using a survey distributed to disability support practitioners via the Austed Network.

3.2 AUSTED SURVEY

The Austed list is an initiative of the Australian Tertiary Education Network on Disability (ATEND). The list facilitates discussion and information sharing for those with an interest in post-secondary education and training issues for students with disability. There are 393 subscribers to the list, comprised of 280

individuals from Universities, 68 from TAFE, and 45 from other organisations. Thirty-nine Universities and 21 TAFE institutions are represented on the list.

3.2.1 METHOD

Researchers used the Austed email distribution list to circulate an electronic link to a Survey Monkey questionnaire (see Appendix 1). Respondents were asked to answer two multiple-choice questions. The first indicated the types of supports provided to students with ASD, and the second the types of supports provided to the staff (academic and professional) working with students with ASD. The multiple-choice options were devised through liaison with the University of Tasmania Disability Practitioners. Additionally two optional open-ended questions were asked to elicit responses on what were considered the most effective ways to support students, and for respondents to provide examples of good practice in supporting students with ASD within their higher education institution. Respondents could indicate if they would be willing to provide further information on their institution's support for students with ASD. The Research team contacted a cross-section of those who indicated their willingness to develop case studies of support (see Section 3.3 below).

Analysis of the quantitative data was provided by the 'Survey Monkey' tool. Thematic analysis was conducted on the responses pertaining to the types of supports considered to be most effective, and the examples of best practice.

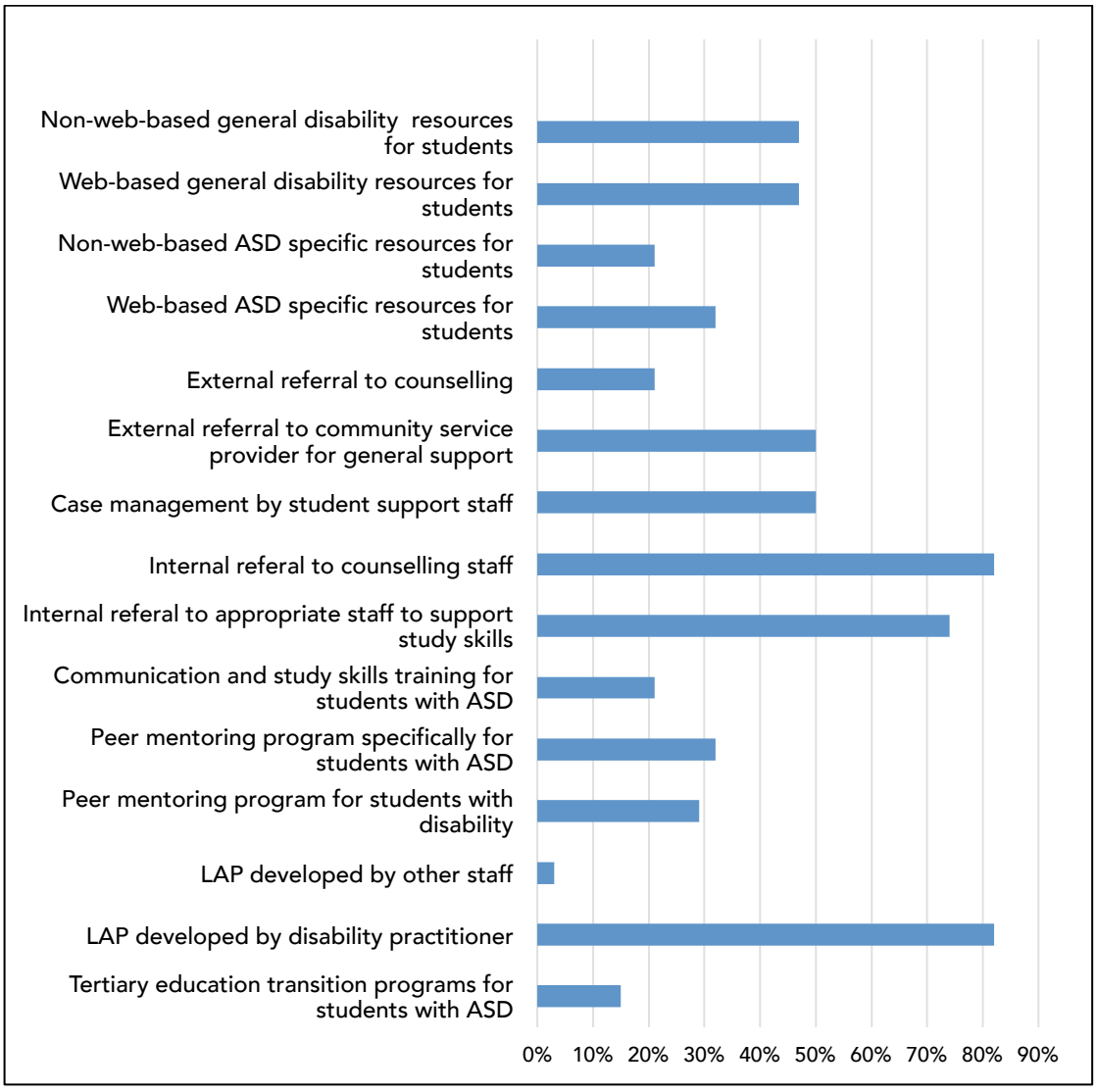
3.2.2 FINDINGS

Thirty-five responses to the survey were submitted. However one respondent had completed and submitted the survey twice. The second response was deleted and not used in the subsequent analysis. Of the final 34 responses, 64% were from University, 29% from TAFE, 3% a combination of both and 3% other. The numbers of students with ASD at each of the institutions varied from between 10-19 students (5 institutions) to more than 50 (2 institutions); however the majority indicated that the number of students with ASD was unknown (17 institutions). Additionally, many of the institutions that provided numbers stated that these were only the students known to disability services and that the actual numbers could be higher.

The data indicates that the most prevalent forms of assistance provided to students with ASD were a LAP developed by the institution's disability practitioner (82%), internal referral to counselling staff (82%), and internal referral to appropriate staff to support study skills and organisation (74%). Higher education institutions also supported students with ASD through external referral to community service providers for general support (50%), case management by student support staff (50%), and the provision

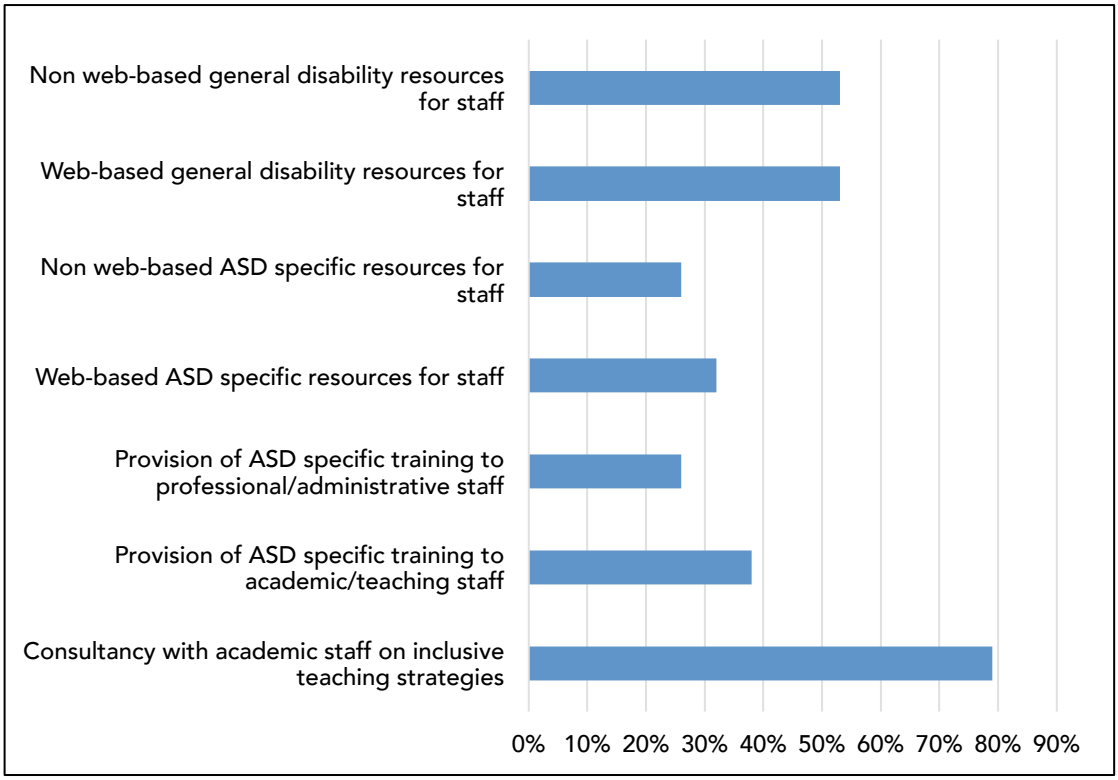
of web-based or non-web-based general disability information (both 47%). Less prevalent modes of support included the provision of peer mentoring programs for students with ASD (32%), communication and study skills programs for students with ASD (21%), and secondary to higher education transitional programs for students with ASD (15%). Figure 2 outlines how institutions support students with ASD.

Figure 2: Types of supports provided to students with ASD by Higher Education Institutions



The highest proportion of support provided to staff working with students with ASD was consultancy regarding inclusive teaching practices (79%). Staff were more likely to be supported through web-based general disability resources than web-based ASD specific resources (53% compared to 32% respectively). Congruently, this was also the finding for non-web-based staff resources, with 53% providing general disability resources compared with 26% providing ASD specific resources. The provision of ASD specific training to academic or teaching staff was delivered by 38% of institutions, and to professional staff by 26% of institutions.

Figure 3: Supports provided to staff working with students with ASD in Higher Education Institutions



Twenty-seven respondents (63% from university, 30% from TAFE, 3.5% from a combination, and 3.5% from other) provided feedback on what they considered to be the most effective ways to support tertiary students with ASD. Many respondents gave a number of different strategies. Overall there was a strong emphasis on the provision of individualised assessment and support to reflect the specific needs of each particular student. Responses were coded and classified as either the types of supports required or the method for providing these supports. These are outlined in Tables 1 and 2 respectively.

Table 1: Types of Supports

Category	References in Study
Transition support	• Group program for understanding university life • Providing support through transition • Support for transition • Preparation and plan of course outline and delivery methods • Support with enrolment, timetables, etc. • Individualised transition planning • Explicit guidebooks/information about training/expectations • Orientation sessions and information • Transition carefully with emphasis on physical orientation • Support with transition programs • Transitional support • Campus familiarisation before course commences • Orientation to new campus program
Study and organisational skills	• Group program for study and communication skills • Support with time management, organisation, task analysis & communication • Course handouts including step by step instructions • Assist them to develop skills to support their studies (organising) • Provide one-on-one study skills support to assist with organising study tasks, staying focused and on track with schedule • Assistance with time management, organisational skills and alternative assessment formats • Assistance to stay on track with assignments • Intense study support • Organisational skills • Assistance with time management and planning • Study skills and organisational support one on one • Linking students with study skills support
Social and/or personal development	• Group program to develop support network • Transition carefully with emphasis on social connections • Support with social skills • Individual career planning sessions • Developing leadership and self-advocacy in Uni life • Support from counselling - working in groups and group assessment • Encourage disclosure where appropriate • Social and self-awareness and self-determination • Independent living skills and money management • Developing coping and behavioural strategies
ASD specific strategies	• Communication with student about what their ASD might mean at Uni and sharing strategies to cope/ask for help • Having quiet areas for students to access • Build on social stories used for younger children • Have students develop and rehearse exit strategies • Smart phones to record scripts, affirmations and support messages • Support with executive function deficits • Breaking down tasks into small chunks • Visual scheduling • Provide structures

Table 2: Approaches to Supports

Mentoring	• Peer mentoring by senior students for one semester • Mentoring • Create mentor groups for students who identify as ASD • Mentor program - 1-2 hours support each week • Mentoring • Peer support work • Peer mentoring program • Mentor ongoing support for first semester • Peer Buddy • Study skills support through mentor/adviser • Provide a participation assistant through settling-in period • Peer mentoring within the student's course (non-disability specific)
LAP	• Develop LAP with DP and communicate supports to staff • Defining individual needs through LAP and liaising with lecturers • Individualised support plans • Mentors assist negotiate LAP with Course Coordinators • Work with students, parents and teaching staff to develop LAP • Linking students with appropriate contacts within their area of study
Proactive case management	• Individual coaching and support • Have a staff mentor – teacher, DP or support worker • Case management with positive therapeutic relationship • Case management for problem solving • Concurrent counselling support • Keep in regular contact with student particularly in settling-in period • One to one case management with regular appointments • Follow up • Have regular check in times, particularly in transition • Briefing and debriefing for students in potentially challenging situations
External liaison	• Inclusion of the student, parents, carers from the beginning • Involvement of parents and/or previous support workers initially • Working together with students and parents • Provide support based on the support provided through high school • Liaising with treating clinicians for specific recommendations
Method of communication	• Have a constant one person contact • Consistency • Clear communication (2) • Asking lots of questions to find out what works and what doesn't • Develop trusting relationships • Help students identify skills and talents • Listen to the student who usually knows what works best for them • Listen and observe • Taking each student on an individual basis • One-on-one support • Individualised planning
Education of staff	• Staff fact sheets on how to support students with ASD • Working in consultation with academic staff to inform assistance • Disability adviser that understands ASD • Liaising with and training provided to academic staff • Teaching departments that understand & provide supportive environment • LAPs support plans that include advice/resources to staff • Ensure teaching staff are informed/aware of student's learning style • Educate staff and advisers so that best practice is maintained • Understand the crippling effects of anxiety • Understand individual context to experience of anxiety in ASD students

There were four types of supports that were considered effective (see Table 1). These were: the development of study and organisations skills; facilitating social and/or personal development; transition support; and the implementation of specific strategies to address ASD challenges. Supports coded under the latter included such things as visual schedules, use of social stories and scripts, and the provision of quiet areas. Transition support incorporated familiarisation with campus facilities, adjustment to campus life, and an understanding of higher education expectations. The highest rate of mention was for transition support (13 references from 11 institutions), and this was followed by study and organisational skills (12 references from 9 institutions). Specific ASD strategies were mentioned nine times from four institutions, and social/personal development ten times from seven institutions.

Responses that alluded to effective method of delivery of supports to students with ASD were themed into six distinct approaches (see Table 2). These were: mentoring; LAP; proactive case management; external liaison; education of staff; and the method of communication with the student. Responses that mentioned regular contact and review, coaching, and debriefing were included under case management. The LAP category included responses mentioning individualised support and study plans. External liaison emerged as a theme and included working closely with parents, clinicians, and previous support staff to gain an understanding of the specific requirements of each particular student. The method of communication incorporates mention of the need for clear and consistent messages, acknowledgement of student's experiences, existing skills and strategies. References to ASD specific mentoring (12 references from 11 institutions) and the method of communication (11 references from 7 institutions) were the most frequently cited methods of delivery. This was followed by education of staff and case management (10 references from 9 institutions respectively). A LAP process was mentioned six times from six institutions, and external liaison five times by five institutions.

Eighteen respondents provided information on best practice in supporting students with ASD. These were analysed and classified according to the types of supports identified as most effective. Supports for study and organisational skills, and transition were both mentioned in six of the case studies. Utilisation of particular methods of communication and mentoring were also mentioned in six case studies. Specific ASD strategies were mentioned five times. Supports including mention of social and/or personal development were noted four times. The education of staff and individualised LAP were both cited three times, and external liaison once. Table 3 provides the case study information and corresponding categories.

Table 3. Supports and approaches by institution

University		
Description	*Types of supports*	*Approaches*
Peer facilitated study skills group offered twice a year to students with ASD Aims to build confidence and competence with study skills and understanding University life. Aims to develop leadership, self-advocacy, and support network	• Study and organisational skills • Transition support • Social/personal development	
Assessment tool specifically for students with ASD Enables Disability Support Staff to ensure they understand and address potential learning issues and barriers	• Specific ASD strategies •	• Method of communication • LAP
Intensive mentoring support Participation Assistant program covering physical orientation, social connections, disclosure, time management and planning	• Study and organisational skills • Transition support • Social and/or personal development	• Mentoring
Program that provides practical skills to help students develop required skills to manage at Uni	• Study and organisational skills • Transition support	
Paid mentors who provide 1-2 hours support each week. Assist students stay on track with assignments and negotiate LAP. Prior to using mentors students with ASD often dropped out, now most complete their studies.	• Study and organisational skills	• Mentoring • LAP
Peer mentoring program. Mentors are senior health sciences students who are provided with initial training and ongoing support. Has increased retention and success rate		• Mentoring
Participation Assistant for transition	• Transition support	• Mentoring
Participation Assistants who are more experienced students to assist with academic skills, communication skills, time management, planning, task analysis, organisational skills and assist students develop own strategies. Meet on regular basis. Support and training for Assistive Technology. Encourage disclosure and advocacy	• Study and organisational skills • Social and/or personal development	• Mentoring

TAFE		
Description	*Types of supports*	*Approaches*
Individual orientation prior to commencing and applying for courses Course handouts including step-by-step instructions for learning and assessment tasks Staff guide on how to provide learning support	• Transition support • Study and organisational skills	• Education of staff
Students work closely with Disability Practitioner to develop strategies and achieve goals Regular and consistent feedback between Disability Practitioner, teachers and family		• LAP • External Liaison • Method of communication
Do not overwhelm student and have clear contact times if needed		• Method of communication
Paid 'buddy' trained by Disability support staff. Peer in same course but in year higher		• Mentoring
Clear and open communication between all parties		• Method of communication
ASD presentation to staff and other students		• Education of staff
Asking lots of questions, developing coping/ behavioural strategies and trusting relationships. Having teaching departments understand and provide supportive environments	• Specific ASD strategies • Social and/or personal development	• Method of communication • Education of staff
Student who had anger issues was encouraged to carry strategy sheet and refer to it when anger was building	• Specific ASD strategies	

OTHER		
Description	*Types of supports*	*Approaches*
Work with students to develop personal profile and disclosure plan prior to transitioning. Includes impact of disability, reasonable adjustments, scripts and strategies for appropriate disclosure	• Transition support • Specific ASD strategies	
Structure, flexibility, support with executive functioning, breaking down tasks, visual scheduling, follow up and understanding impact of anxiety	• Specific ASD strategies	• Method of communication

3.3 CASE STUDIES

In this section some of the approaches seen to represent good practice in supporting students with ASD in higher education are illustrated through a series of case studies.

3.3.1 ANU PARTICIPATION ASSISTANTS

The ANU assists students on the Autism Spectrum through a Participation Assistant (PA) program (see McLeod & Harrison, 2013). This initiative followed from an experience in 2011 at ANU where twins with Asperger's Syndrome were experiencing difficulties transitioning from home to university accommodation. The introduction of a PA to help them at their residence, as well as with other strategies, was instrumental in retaining the students at university and particularly for their social integration into the hall. The twins have since performed very well in their studies with one graduating and the other going on to do Honours in 2015.

The increase in numbers of students registering with Asperger's Syndrome in 2012 at ANU prompted the extension of the program. A PA is offered to all first year or new ANU students who identify with ASD and are registered with the ANU Office of Access and Inclusion (A&I). The PAs are second or third year ANU students who are selected because of their interest and experience in the field of disability. The service provides individualised support of up to five hours per week to meet the unique needs of each student. PAs assist students by providing an orientation to university life; incorporating study skills and time management, accommodation adjustments, social adjustment, establishing relationships with academics and professional staff, and general assistance in familiarisation with university systems. Students and their PAs meet periodically with the Student Access and Success Officer (SASO) for feedback and review of their progress. PAs also submit a fortnightly journal reporting on their meetings with the student.

From 2013, A&I have provided funding for a part-time Project Officer to improve service delivery and ensure the ongoing success of the PA program. Funding for the PAs is provided by the University and a percentage is later claimed under the Additional Support for Students with Disabilities (ASSD).

Since 2012, twenty-eight students with ASD have benefitted from the program. Of these, ten students have been able to advance from the program after one semester of PA support and continue independently in their studies. Eighteen students continued in the program throughout second semester, and some into the subsequent year at reduced hours.

Outcomes from the program are very positive with all participants continuing in their degree programs. Satisfaction surveys indicate improvements in time management/organisational skills, increased communication skills, success in navigating university IT systems, improved orientation to campus and

improved decision making. These students are also more likely to contact A&I for support and advice if they begin to fall behind with their coursework or have queries regarding their study program.

3.3.2 CURTIN UNIVERSITY SPECIALIST PEER MENTORING PROGRAM

Curtin University assists students with ASD through a Specialist Peer Mentoring Program. Commencing in 2014, this program was developed by identifying and utilising appropriate and relevant elements from successful initiatives employed at the University of Cambridge, UK (see Hastwell et al. 2013a) and York University, Canada (see Bebko, Schroeder & Ames 2011).

Mentors are post-graduate Health Sciences students from the fields of Speech Pathology, Occupational Therapy, and Psychology. They are provided with initial training in general mentoring, and an additional one-day ASD specific training course that incorporates an introduction to the mentees. During the program mentors also attend a weekly one-hour group supervision session with the program coordinator. Potential mentee participants are identified and referred to the program through Disability Services. Though students need to be registered with Disability Services, they do not require an official diagnosis of ASD.

The development of the mentoring relationship is very important to allow for a highly individualised approach. The assistance offered is determined by the particular needs of the individual mentee. Regular meetings are held between mentor and mentee with contact varying from face-to-face, a combination of face-to-face and on-line, or completely on-line. Mentees have been assisted with time management and organisations skills, communicating with academic staff, gaining and interpreting feedback on assignments, accessing additional tutoring and workshops, accessing student support counselling services, linking with career services, and facilitating work placements. A weekly social group has also been formed that mentors and mentees can attend.

There were 17 mentees in the program in 2014, and 32 in 2015. The program currently has 23 mentors, as some mentors support more than one mentee. While mentees can opt to be part of the program for as long as they wish, there is an emphasis on the development of agency and independence with the mentees.

An initial evaluation of the program by Psychology Masters students found an increase in wellbeing and social engagement. Other preliminary evidence suggests increased retention and academic outcomes, with one student's grades going from failures to higher distinctions. Currently the program is being evaluated by the Autism CRC.

The program is run by two coordinators for one day a week each. Presently, Curtin funds one of the coordinators and Autism West, a not-for-profit organisation, funds the other coordinator. However, this

situation is being reviewed given the increasing numbers of students accessing the service. A proportion of the costs for the mentor support are also claimed through the Australian Government Students with Disabilities (ASSD) funds.

3.3.3 FLINDERS UNIVERSITY MENTORING PROGRAM

Flinders University provides a mentoring scheme for students with ASD. The program has been operational since 2009. In 2015 there are five students with ASD being mentored.

The mentor is a paid member of staff with an understanding of the issues and challenges faced by students with ASD. Partial reimbursement of this salary is claimed through the Australian Government Students with Disabilities (ASSD) funds. The mentor provides between one and two hours of assistance per week to the students during semester. This includes assistance with time management, study organisational skills, linking in with other student support services as required, support with negotiating their Learning Access Plan with Course Coordinators, assistance with on-line resources, and familiarising students with the campus facilities.

Potential mentee participants are identified by Disability Advisors. Mentoring has assisted improved communication skills, and assisted with the retention of students with ASD.

3.3.4 UNIVERSITY OF SOUTHERN QUEENSLAND 'A-SKILLS' PROGRAM

The University of Southern Queensland (USQ) assists students with ASD through a peer facilitated study skills program. The 'A- Skills' program is run for 1 hour per week for eight weeks, with each program accepting up to 8 students per semester at each campus. This initiative was piloted in 2014 at the Springfield Campus as a response to the growing numbers of students with ASD who experience study challenges and social isolation. The program has since been expanded across the Toowoomba and Fraser Coast Campuses, and is likely to be offered at the Ipswich campus in the near future.

The program aims to increase the retention of students with ASD through enabling autonomous personal learning, enhancing overall wellbeing, and alleviating social isolation. It is grounded in self-determination theory (see Ryan & Deci 2000), and co-facilitated by two senior students. To date this has been fourth year psychology students or students with experience of ASD. Facilitators are provided with training in autonomy-supportive facilitation, which emphasises guiding participants rather than information delivery, and are paid two hours a week for ten weeks.

Facilitators guide students with ASD in developing study skills required for successful university study. Whilst participants have choice in the topics covered, there is a focus on organisation and time management, strategies to manage the university context, communication with lecturers and other

students, identifying values and learning styles, and identifying where and how to seek additional support when required. The program also provides the opportunity to hear from USQ staff from academia, student services, and career services. Additional topics have centred on issues around success, communication and disclosure of ASD in the workforce, and have incorporated external guest speakers who are on the spectrum and who have successfully navigated tertiary studies and employment.

The program is managed by the Disability Practitioner at each campus and is available to any student with ASD. Students registered with the Disability Practitioners are sent information and it is disseminated through the University's website. Whilst the 'A-Skills' Program is promoted as a study skills program, participants have also reported the benefits of the program in the ability to share experiences and foster relationships with other students. Other feedback indicates improved wellbeing and increased competence in managing study goals. USQ are currently evaluating the program across three campuses with results expected in December 2015/January 2016.

3.3.5 CHISHOLM INSTITUTE INDIVIDUALISED SUPPORT

The following is a case study of the provision of individualised support to a student with ASD at Chisholm Institute.

David (pseudonym created for this report) had successfully completed an Advanced Diploma with the Chisholm Institute, however was experiencing difficulties in his Bachelor degree course. David has ASD, but he had had no previous contact with Disability Services Team in his Diploma studies. However, the Bachelor degree teaching team contacted the Chisholm Institute Disability Practitioner (DP) with a number of concerns about his classroom behaviours.

The DP met with the teaching team to identify the specific behaviours of David that were considered disruptive. These included talking/singing aloud to himself, walking around the classroom making repetitive statements regarding his lack of understanding of the subject material, and generally interrupting the teacher and other students with constant noises and questions.

The DP met with David and his mother on several occasions. These meetings identified David's concerns and frustrations, and tapped into some of the strategies he used outside the classroom to deal with situations. The involvement of David's mother was instrumental in providing strategies and engendering a greater sense of self-awareness of the impact of his behaviours on the classroom dynamics.

Through this external and internal consultation effective strategies were developed to support David and improve the learning dynamics of the classroom for all. Strategies included techniques for David to increase his concentration when required, creating a system where all students' questions were addressed during an allocated time, and the provision of handouts for additional information covered in the lectures that were not outlined in the computer notes.

The inclusive teaching strategies and supports were documented in a Learning Access Plan, and reinforced by ASD specific information and training provided to the teachers and fellow students. The use of the '10 things every child with Autism wishes you knew' video clip was particularly effective in providing insight into the experience of living with ASD. The training also emphasised the rights to an education. The Chisholm Institute intends to extend support by providing ASD specific training for all academic staff.

4.0 Student Experiences

4.1 OVERVIEW

This section provides in-depth qualitative analysis of the experiences and individual needs of students with ASD at one higher education institution – the University of Tasmania.

The University of Tasmania is the sole university for a diverse student population in a regional/rural state that is the site for the pilot rollout of the NDIS for adolescents and young adults. It has the highest number nationally of commencing domestic undergraduates with a disability (8.7%), exceeding the national target of 8% for enrolment of students with disability (Koshy 2014). As of 12 May 2015 there were 42 students with a diagnosis of ASD currently registered with Disability Services representing approximately 5% of the total number of students with Learning Access Plans. However, the total number of students with a diagnosed ASD at the University is likely much higher as declaration of disability is voluntary. The number of students with a declared diagnosis of ASD increased significantly between 2012 and 2013 from 29 to 41 students and has remained relatively stable over the past three years.

The University has a number of campuses, with the majority of students concentrated on the main Sandy Bay campus in the south (Hobart) and the Newnham campus in the north (Launceston). Disability Services and Advisers can be accessed on both campuses, although only the Sandy Bay campus has a dedicated facility in the form of the Student Access Study Centre (SASC). As described on the University's website:

> *This centre houses resources and specialised equipment in a fully accessible study environment. The Disability Adviser provides access to this centre for students whose needs cannot be met through other generic facilities on campus.*[2]

The key mechanism for providing support for students with Autism Spectrum Disorder is via a Learning Access Plan (LAP), which is developed in consultation with the student and one of the Disability Advisers. There are no ASD specific resources at the University of Tasmania, although the University ran a series of workshops and information sessions in 2014-15 to educate staff about the needs of students

[2] http://www.utas.edu.au/service-desk/helpsheet/students-with-disabilities Accessed 9 Oct 2015

with ASD. Peer mentoring has also been provided to some students on a case-by-case basis, although there is no formal program of delivery. Other supports available on an as-required basis include:

- case management provided by trained counselling staff and in conjunction with the relevant Disability Adviser;
- referral to a Student Adviser for individual assistance with time management , organisational skills and assistance with staff interactions;
- staff consultation regarding individual student concerns, issues or behaviour management;
- consultation with community service providers regarding individual students.

4.2 METHOD

The research employed the method of self-directed photography, where data is gathered through photographs taken by participants in combination with in-depth interviews. The researchers have successfully employed this method in a study exploring experiences of home from the perspective of parents of children with ASD (Owen & McCann 2013). Most individuals with ASD are strong visual learners and the use of visual aids can facilitate their ability to make sense of and provide order to the complex social world (Mirenda & Iacono 2009). The photographs may also assist the students to communicate during the interviews by providing a visual image that aids in expressing feelings, thoughts, wants, or needs. Further, the approach enables information to be collected at a time that is convenient for the participants, minimising intrusion in their lives (Warren, 2005), but happening in the reality of their experience (Wang & Burris, 1994).

PARTICIPANTS

Due to the timeframe of the research and the intensive, in-depth approach, recruitment for the study was limited to six participants. Participants were initially sought by contacting those registered with disability support services via their university email address. Recruitment was then extended via information distributed via the University's Facebook page and through Autism Tasmania to expand the potential pool of participants.

Six participants were recruited although one was not able to complete the study (Participant 2). Of the remaining five participants, four are listed on the University's database of students with a disability. Four participants are female and one male. Participants 1 and 3 are located on the main Hobart campus (Sandy Bay). Participants 4 and 6 are located on the main Launceston campus (Newnham), although participant 4 had previously studied on the main Hobart campus. Participant 5 is a distance education student who did not undertake the photography study but participated in an interview. Four

participants were undergraduate students and one postgrad. All participants have been enrolled at the University for at least one year. Two participants had changed courses without completing. Currently two participants were enrolled in the Faculty of Science Engineering and Technology, two in the Faculty of Health and one in the Faculty of Business. All are domestic students.

The demographics of the participants contrast with the profile of students listed on the University's database of students with diagnosed ASD. Of these 42 students: 70% are male and 30% female; 62% are based in Hobart and 38% in Launceston; 90% are enrolled in Bachelor Degrees with a small minority in foundation/preparation, diploma or masters programs; 43% are in the Faculty of Science, Engineering and Technology, 33% in the Faculty of Arts and the remaining 24% across health, law, business, education and other; 98% are domestic students.

DATA COLLECTION

Participants were provided with a digital camera and journal and asked to take photographs that describe their experiences of studying at the University of Tasmania. Information was carefully written in a very direct manner with no unnecessary wording or information to accommodate the general learning style of people with ASD. The journal also contained prompts to assist participants to describe what the photo was about and why they took it (refer Appendix 2). Following the completion of the photography task and review of the photos and journals by the research team, participants were then invited to participate in an interview to discuss their experience of studying at the University. Interviews were directed primarily by the photographs and the students themselves. Hard copies of the photographs were printed and brought to the interview. All interviews were undertaken by a clinical psychologist who has experience with ASD. All interviews were recorded and transcribed with the exception of one that was not recorded at the request of the participant. Notes were written by the interviewer during and immediately following that interview.

DATA ANALYSIS

All information from the photo journal and the interviews was thematically analysed, coded and categorised using the framework analysis approach (Ritchie & Spencer 1994). The initial thematic framework was developed by the research team based on *a priori* issues identified in published research and the emergent themes identified from the participant journals, the interviews and in the subsequent reading of the transcripts. Detailed coding was then undertaken independently by two research assistants to ensure clarity and consistency. The coding was undertaken using Excel spreadsheets to chart where data from participants corresponded with themes and sub categories. Direct quotes from participant journals and interviews were entered in the spreadsheet under relevant themes and sub categories. These case charts enabled comparison across the cases and were then

used to analyse the content and nature of each theme (Swallow, Lambert, Santacroce, & Macfadyen, 2011).

ETHICAL CONSIDERATIONS

The project was approved by the Tasmanian Social Sciences Human Research Ethics Committee. The use of participant-generated photographs poses a specific challenge in relation to maintaining the confidentiality and privacy of the participants, particularly if the images are used when disseminating the findings (Balmer, Griffiths, & Dunn, 2015; Bugos et al., 2014). A number of ethical safeguards were therefore employed. The students had complete control over which photographs were taken and used. A detailed consent form gave participants the opportunity to identify any photographs that could not be used for publications and presentations. All participants gave consent for all photographs to be used for dissemination. Names have not been used to protect confidentiality.

4.3 FINDINGS

The four participants who undertook the self-directed photography task took a total of 79 photographs between them (range 12 to 31 per participant). A summary of the content and quantity of photographs taken by each participant is provided in Table 4 below. The focus of the photographs taken by each participant varied substantially, but the most commonly photographed feature was formal teaching and learning spaces including lecture theatres, tutorial rooms, labs and exam rooms. These spaces featured in the photographs of all participants. The content of other photographs included informal learning spaces, teaching and learning materials, the library, the student centre (including disability support services and the SASC), food and beverage spaces, outdoor spaces, transition spaces, toilets, signage, personal aids and miscellaneous objects.

Table 4 - Summary of content of photographs taken by participants

subject of photo	*notes*	*1*	*2*	*4*	*6*	*total*
formal teaching spaces	includes lecture theatres, tutorial rooms, labs, exam rooms, computer labs	1	6	10	4	21
student lounge/informal learning spaces	includes informal communal spaces, break-out areas	1	0	1	2	5
transition spaces	includes corridors, entrances, exits, stairs	1	1	0	2	4
student centre	includes disability support services	1	2	0	2	5
library		1	0	1	3	5
food and beverage		1	2	0	2	5
outdoor spaces	includes open areas, paving, vegetation, bus stops, parking	3	0	1	6	10
toilets		0	0	0	2	2
teaching/learning materials	includes online, hard copy	1	2	1	3	7
signage		0	1	0	1	2
other/misc objects	lights, clocks, drop boxes, whiteboards, carpets, sanitisers	0	6	0	4	10
personal aids	includes LAPs, organisational aids, stimming aids	2	0	2	0	4
TOTAL		12	20	16	31	79

The thematic analysis is structured under two organising domains – contextual factors and supports. Contextual factors relate to the key issues, needs and problems experienced by the participants under three identified sub-themes – sensory environment, social environment and cognitive environment. The domain of supports also contains three sub-themes. The first, formal supports, includes the participants' experiences of structured supports actively provided to support their learning at university, both in terms of disability supports and learning and teaching supports. The second, informal supports, includes aspects of the university environment that are not explicitly provided to students as disability or learning supports, but that the participants identified as being useful, or even fundamental, in addressing their needs. The last sub-theme, strategies, describes the various things that the students do to support their own learning experience at university. These include coping mechanism as well as tactics that are both subversive and assertive.

4.3.1 CONTEXTUAL FACTORS

In this section we discuss the key contextual factors contributing to the difficulties experienced by the participants in the study. These are the sensory environment, the social environment and the cognitive environment.

SENSORY ENVIRONMENT

Participants identified both the acoustic and visual environments as key issues. There were multiple references made to the noise of other people, as well as speaker volume, squeaking chairs and moveable whiteboards as acoustic stimuli. Particular spaces, such as the on-campus cafés were identified as being particularly acoustically intense. However, participants also noted how the amplification of small noises in quieter spaces, such as the ticking of the standard issue classroom clock is frustrating and distracting.

Please find an alternative for these. (Participant 3 diary)

Most participants identified environmental obstacles caused by some form of visual stimuli. Flickering lights, flickering computers, patterned surfaces, groups of people, lots of colour, lots of 'things', small spaces, glary screens and glary lights caused participants varying degrees of discomfort with carpet patterns described as 'disturbing' (participant 3) and 'distracting' (participant 6). Another participant identified the apparently random use of different coloured chairs in new learning spaces as confusing:

I can cope with this unless I am tired or stressed. (Participant 3 diary)

Not all environments were seen to be overwhelming. Particular spaces and features of the campus were identified as providing more sensorily calming environments. Natural objects such as grass, trees, water and natural light were identified as more comforting. Built environment items such as comfy couches, privacy curtains, solid unpatterned colours, soft (LED) lighting and quieter spaces (both planned and unplanned) helped to form spaces of reduced sensory stimuli. One participant identified the 'common features' of more sensory-friendly environments:

> *… what they all have in common is kind of open space, easy to navigate, not too busy, not too quiet, but open. It's open and outdoors but at the same time it's closed and contained.* (Participant 4 interview)

However, overwhelmingly participants articulated feelings of sensory overload on campus. Participants reported occurrences of exhaustion, stress, and difficulties with concentration as common. High stimulus environments, such as the campus café, can trigger panic; however even the campus library was seen to be a source of stress for some of the participants.

Participants described how this affected their learning – 'you lose the ability to think or process … you're essentially stupider in these environments' (participant 4 interview). The sensory overload can be experienced bodily as well as cognitively inducing headaches and nausea.

It is not only the presence of stimuli but also the ongoing impact of sensory assaults that can cause discomfort, anxiety, and distress, and ultimately result in 'meltdowns'. Participants described how their learning and functioning was impacted for hours or even days after being exposed to overwhelming sensory stimuli.

As a consequence, participants reported their use of self-exclusion as a method of avoiding sensory overload. Spaces of exclusion identified by participants in this study included the campus cafeteria, library and computer lab.

I could not go inside, even to take a picture. (Participant 3 diary, referring to the cafeteria)

Several participants reported feeling that because of their inability to tolerate the sensory environment there was nowhere left to go to. Campus spaces and the accepted use of campus spaces limited options. Self-exclusion from classes (from tutorial rooms and lecture theatres), and therefore from learning opportunities, was used as a definitive way to avoid sensory overload, stress and anxiety by participants.

The need for and practice of self-exclusion, plus the exclusion that occurs because of the lack of ability to concentrate, means that attending class was sometimes seen as a 'waste of time' (participant 4 diary).

SOCIAL ENVIRONMENT

Participants experienced difficulties with social interaction in various ways; avoidance of eye contact and awkwardness with conversational norms caused communication breakdowns. Participant 6 described such social processes as exhausting with the need to continually 'wear a mask' and constantly change it to suit different situations.

The lack of understanding of social norms inevitably impacts on learning. Trying to comprehend an entire 'hidden curriculum' that is instinctive and self-evident to others adds another layer of complexity. Combined with the requirement for class-based group interaction, stresses are compounded and can lead to self-exclusion and failure of courses:

> *I was supposed to do [a group assignment] this semester and I actually left that class.* (Participant 6 interview)

Several participants described the built environment, or specifically the physical arrangement of spaces within the built environment, as problematic. The layout of lecture theatres and tutorial rooms caused anxiety for several participants in forcing close proximity with others. Certain lecture theatres and teaching spaces were also seen to be more problematic due to feelings of visual exposure. There was an expressed preference to be 'invisible' with participants reporting that their physical visibility exposed them to unwanted attentions. This consequently led to stresses that impacted learning by taking away any ability to allay anxieties and to 'focus'.

Thus hiding, or seeking out places to be invisible, was a common on-campus activity for participants. However, the online environment also provided opportunities to 'hide'. Participant 5, a distance-education student, likened the online environment to wearing 'sunglasses'.

However, while hiding or screening provided opportunities for relief and for confidence in certain situations there was also the recognition of the need for, and benefits of, engagement at university. There was an expressed desire for social interaction and inclusion enabled by selected degrees of proximity and engagement. One participant spoke of the value of participating passively in the social environment of campus as an opportunity to develop life skills by watching the interactions of others. The university campus was considered to be a safe place to do this, to leave or to challenge by degrees, personal comfort zones:

> *I had made a conscious decision some time ago now that I had to build myself up as much as I possibly can to all of that to get by in life otherwise I'd just be in my little cocoon all the time at home and that's not healthy*. (Participant 6 interview)

Participant 4 also spoke of the negative consequences of avoiding campus due to the importance of social engagement as a part of the holistic experience of learning. Working with others, being connected and feeling part of a team was upheld by Participant 4 as an important part of the learning process. There were spaces on campus that promoted this feeling, instilling confidence and motivation, and others that quashed it, leading to feelings of being 'trapped' and strategies of avoidance.

Participants expressed, both by direct statement and by example, a need for structured but smaller social settings that foster, rather than force, social interaction. The key issue is choice; the provision of experiences that offer opportunity to engage but do not demand it, and that provide options for the means to do so.

COGNITIVE ENVIRONMENT

The cognitive environment encompasses issues related to difficulties in 'making sense' of the world. It is discussed under three sub-themes - navigation (way-finding), legibility (meaning-finding) and the relationship between learning styles for people with ASD and emergent pedagogies.

Navigation

A key issue discussed by participants was a sense of disorientation in navigating the university including both the academic environment and the built environment.

In the academic environment, at a macro level participants reported problems navigating the processes of application and entry to the university and into university courses. Participant 5, a distance student, reported that there were many positive aspects associated with being physically removed from the university campus, however navigating enrolment was not one of them:

> *I had to actually go in I couldn't do it distance. There is no way I could do it distance. I was just getting lost in a web of stuff.* (Participant 5 interview)

The structure of courses themselves coupled with the administrative processes that link them were also problematic. In fact, one participant described how it was 'the structure of the university' not the 'academic content' that was the cause of his greatest difficulties at the University. Two other participants talked about the difficulties of navigating the Arts degrees and the contrast in subsequently moving to a more highly structured degree in another Faculty.

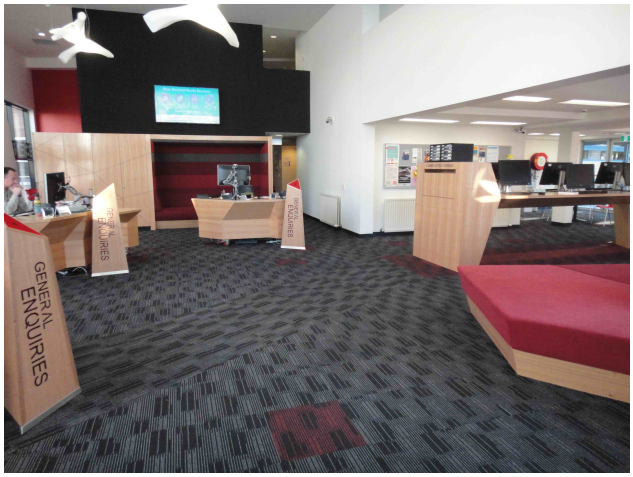
Participants consistently commented on their preference for structure, for requirements and directions to be broken down, literal language used and choices reduced. At a micro level, the navigation of learning materials was also seen as complicated. Inconsistencies with the type of materials and resources required by different courses, and the sheer volume of resources supplied was overwhelming. Even within the context of individual units participants experienced difficulties understanding instructions in learning materials. Participants also described their difficulty in navigating coursework temporally. The ability to keep track of where they were up to in a particular course and to structure personal time management around course requirements caused frustrations.

Similarly, navigation of the campus built environment posed difficulties for participants. Interpreting both direct and indirect navigational structure was problematic. Structure and spaces assumed to be supportive offered little assistance and direct navigational aids often led to greater confusion. Systems employed on the campus, such as the campus map, were described as being illegible and tended to

exacerbate problems rather than aid navigation. Room numbering systems and even the library's Dewey classification system caused confusion and time wasting and could even result in students missing class.

Not only were the processes associated with finding places or things on campus challenging, but confusion about where to go within spaces was also commonly described. Reading or translating navigational clues in the built environment was problematic. For example, when talking about the new cafeteria, Participant 6 noted: 'It also has two cash register spots and that is confusing' (diary), and speaking about the new student services centre said: 'I never know exactly where I'm supposed to line up and wait for staff' (diary).

Student Centre (Participant 6 diary)



Participants articulated a need for clearer, more direct visual support in navigating the campus and the online environment.

These everyday encounters with environments and systems that are disorientating cause high levels of frustration. Apparently small and inconsequential activities had the potential to heighten anxiety. Participants expressed frustration with assumptions made about how people interpret and navigate environments, and the lack of understanding of how these assumptions can impact learning and wellbeing.

> *It's just that I get really frustrated that they think that everyone should know something and we actually don't.* (Participant 5 interview)

Legibility

The assumption that 'everyone knows', or that everyone understands environmental cues, is indicative of an assumed legibility of both built and virtual spaces by neuro-typical individuals. For people with ASD interpretation can be considerably different. Commonly, problems of legibility are associated with

an ASD tendency toward more literal interpretation. Participants described problems in understanding the meaning of unit outlines and assignment tasks. For verbal instruction, the use of indirect and potentially ambiguous language can be even more problematic. Words that do not expressly form part of an instruction, and that do not contribute to the literal meaning and intent of it, can be confusing or misleading. Participant 6 described how the inexplicit instruction by lecturers impacted her performance and even led to her complete withdrawal from some courses. By contrast, she stated 'I do well with clear instructions' (participant 6 diary).

In the online environments, similar frustrations were reported. While the online environment offered benefits by reducing stress from direct social engagement, it conversely presented greater cognitive difficulties in understanding what to do 'because … you're only listening, you can't see anything' (participant 5 interview). This difficulty can lead to a preference for face-to-face communication despite a person's difficulties with social interaction.

An even greater problem experienced by students with ASD is that they may not even recognize that they have misinterpreted information. Thus, as one participant explained, there is not only a need for clear instructions but also for periodic and continued assessment to confirm that you are on the right track:

> *I find assessment tasks a bit stressful, but I would prefer that than the stress of not knowing what I'm doing all the time.* (Participant 6 interview)

Such direct and measured reinforcement can provide a means of keeping up by establishing clear performance requirements, and by ensuring that expectations are understood.

Learning styles and new pedagogies

The issues discussed above concerning navigation and legibility are, for some, exacerbated by more recent developments in education, especially in the context of the increasing preference for student-directed and unstructured learning. One participant expressed her confusion with the recently introduced 'self-directed practicals' (participant 6 diary). However another participant expressed a preference for a looser framework for learning, where 'You've got a variety, you can choose what kind of things you want to work on' (participant 4 interview)

The preference by a person with ASD for engagement with an activity or study of special interest can heighten focus and promote increased participation - as Participant 4 states, 'if I don't enjoy something I won't learn it' (interview). However, the opportunity for dedicated focus in areas of special interest can also have the reverse effect. It can be problematic unless clear boundaries are established. With

independently driven selective focus there is the potential for a particular task to become all-consuming resulting in the complete exclusion and detriment of others. This potential, or 'tunnel vision' was recognised as problematic by Participant 4 but there was also the recognition of an inability to limit focus and withdraw attention. Therefore, while open-ended self-directed learning is becoming increasingly prominent, other pedagogical approaches that offer more highly structured, incremental methods can aid learning for some. By breaking down complex tasks into more manageable but complete units of work, the need to continually shift focus from one incomplete thing to another is eliminated. This method can be beneficial for someone like Participant 4 who expressed a preference for 'learning in blocks' (interview); however, for others, block learning can be frustrating. There is a contrast and potential conflict between the need for order and structure for some participants, and the need for more open-ended learning to pursue tasks of special interests for others.

This disparity was illustrated by two contrasting descriptions of learning environments. For participant 6, new learning environments that enable multi-modal learning were overwhelming:

This photo makes me think about how I spent a lot of the lesson trying to work out which way to sit…. There are whiteboards almost the whole way around the room. This added to my confusion.
(Participant 6 diary)

Conversely, for participant 4, the more 'casual' approach to learning was seen to be beneficial. Talking about the design of one of the 'Sim Labs':

It makes learning a lot more casual and self-directed ... the whole atmosphere changes a bit. You can kind of realise that you're allowed to do that, there aren't really rules in place. It's more something that just flows. (Participant 4 interview)

4.3.2 SUPPORTS

The diversity of experiences and preferences of students with ASD means that there are no easy solutions – one size does not fit all. Consequently the provision of appropriate supports is also complex. In this section we discuss the issue of supports in relation to the sub-themes of formal supports, informal supports and strategies.

FORMAL SUPPORTS

'Formal supports' are conceptualised here as systems and facilities specifically designed or provided by the university to support students with disabilities, including students with ASD as well as general learning supports for all students. The range of supports at the University of Tasmania discussed here include the Student Access Study Centre (SASC), online learning support (MyLO), Learning Access Plans (LAPs) and staff awareness and support.

Student Access Study Centre

The Student Access Study Centre (SASC) located on the Sandy Bay campus in Hobart is the key centre of provisions for students with disabilities at the University of Tasmania.

Currently other campuses do not provide dedicated study centres for students with disabilities, although access to some resources and specialist staff is provided through their various Student Centres. The value of these facilities to students was evident in the different responses from participants

located on the Sandy Bay (southern) and Newnham (northern) campus and the experience of one participant who had studied on both campuses.

The SASC provides alternative study spaces that are more attuned to the sensory needs of students with ASD. Although not designed specifically for such students, these spaces, and the privacy, quiet and 24 hour access they afford, were seen by participants as a very valuable support. Participants described the SASC as 'really helpful' (participant 3) and 'amazing' (participant 4) in supporting their study on campus. In addition to facilitating study, the SASC also provides a 'safe space' of retreat from the general sensory assault and stresses of study. Participants emphasised the effectiveness of access to these spaces in coping with 'sensory overload' and helping to 'stop meltdowns' (participant 3).

For participants on the Newnham [Launceston] campus, where there is no provision of such facilities, participants found it difficult to identify 'safe spaces'. For one participant, the lack of such a space resulted in her having to use the toilets when she felt a seizure coming on:

> *I felt sad that I had to lock myself in a toilet (and I don't like public toilets) to have a seizure in so that I wouldn't be judged or stared at.* (Participant 6 diary)

The lack of provision of dedicated, or identifiable, safe spaces on this campus can have wider consequences for student participation. One participant explained that without being able to find a safe space:

> *I'd be more likely to avoid coming out here…* (Participant 1 interview)

This self-exclusion from campus was also recognised by the student who has had experienced studying on both campuses stating that since moving to Launceston he is 'on campus a lot less' (Participant 4 interview). For this participant, the support the SASC provides is seen to be vital:

> *Put simply without an SASC, I won't graduate.* (Participant 4 diary)

Online and distance education support

Given the difficulties of working on campus, particularly on the northern campus without an SASC, the University's online learning system, MyLO, becomes a support to students with ASD. On the occasions when the stresses of attending class in person are too challenging, it provides an alternate means of accessing course content. Additionally for those who do attend classes, competing sensory sensitivities can impact on concentration levels. MyLO lecture recordings then support later review of class material. The online environment also provides an alternate means of communicating with lecturers, avoiding the stresses of social interaction and enabling students to 'edit' language. One participant

expressed a preference for even greater provision of flexible, off campus learning with a 'take-home exam' offered by one lecturer providing a less stressful experience than on-campus exams. However, despite the benefits it undoubtedly provides to some students available resources inevitably limit further development of such individualised support.

Learning Access Plan

The key mechanism of individualised support for students with disabilities is the Learning Access Plan (LAP). The scope of provisions outlined in LAPs varies with individuals, and is negotiated between the student and a disability advisor. Typical provisions in LAPs include extensions for assignments and alternate provisions for examinations including breaks, additional time and a relatively quiet, sensory neutral space. Not all provisions in LAPs were seen to be beneficial. While participants recognised the additional support provided for exams as being beneficial, or even fundamental to their success at university, one participant felt that the LAP did not always provide the right kind of support and that provisions, such as extensions, could even 'make it worse' (Participant 4 interview). One participant thought that the LAP 'was not particularly useful' (Participant 3 interview), while another expressed frustration at the limited scope and detail of LAPs and suggested that they contain more specific and detailed information on provisions to meet individual needs (participant 6).

LAPs do not typically spell out specific provisions, as these must be negotiated with individual lecturers in response to diverse contextual factors across the breadth of the curriculum at the university. For students with ASD, this requirement for proactive negotiation can be difficult.

While the LAP was seen to be useful in aiding and simplifying communication with multiple staff, a further problem lies in varied responses of lecturers in response to LAPs. One student expressed frustration at the common 'generic' response from lecturers, while another stated: 'I either get treated like Rain Man, or that I'm completely stupid' (Participant 6 interview).

Staff awareness and support

The experiences of staff awareness and support at university were highly varied. Participants described staff interactions as some of their most enriching and some of their most debilitating experiences at university. One participant spoke about how an individual lecturer was responsible for her continuing to pursue her studies:

> … *if it wasn't for her [lecturer X] I would have pulled the pin. I wouldn't actually be there now, at all. I would have thought, no this is just too hard, I just feel like an idiot.* (Participant 5 interview)

Staff awareness and understanding is seen as more important even than modified support provisions or concessions. More broadly, attitudes to 'disability' were the cause of frustration, with one participant advocating an approach to support that was more about 'capitalisation' than 'mitigation' (Participant 4 Diary). Another highlighted the problems of public conceptions of disability, and its conflation with physical impairment:

I felt a bit sad that [the logo] is highlighting difference, and the stereotype that someone with a challenge therefore must be in a wheelchair…. This photo makes me think about wanting to re-design the concept of disABILITY. (Participant 6 diary)

One cause of her frustration is the fact that she gets 'weird looks' for using this car space and wearing 'boots with heels in them' (interview). The disabled car parking spot is particularly important for this participant, as it is her only option for a 'safe space' given the absence of a SASC on the Launceston campus. Thus, the purpose of this formal disability support is transformed from a space that enables access to a space that enables retreat.

INFORMAL SUPPORTS

Aspects of the University environment that support the students' experience, but that are not directly conceived as supports, or, as in the case above, are conceived as supports for different purposes, are conceptualised here as 'informal supports'. One of the main categories of informal supports is the built environment, with participants identifying a variety of places and features that support their wellbeing on campus. In addition to the disabled car park mentioned by the participant above, participants identified other areas that become alternate 'safe spaces', or just more restful places to relax and study.

Key features of these alternate 'safe' or relaxing spaces are that they are sensory-friendly, offering relatively quiet retreat, with comfortable seating and natural light. They also support the cognitive and social experience of students with ASD being legible, easily navigable and offering choices of social participation where students can be hidden from view, but not entirely separated or too enclosed. Many of the spaces identified by participants were outdoor spaces that encompassed these qualities, but participants also identified a range of other spaces around campus that provided more supportive environments for learning, relaxing or socialising. These places are only gradually discovered by students, with some additional beneficial places even being identified by students during the course of their participation in this research.

Uncertainty about rules of access may limit use of these spaces by students with ASD. Their location can also enable or constrain use. Spaces immediately adjacent to classrooms allow for the opportunity to take short breaks, and 'relaxing' spaces within the learning space allowed students to partially withdraw, but remain peripherally engaged in what is going on.

Participants also discussed spaces and amenities on campus related to sustenance. In particular access to water at the campus water stations was highly valued as a means to reduce stress. Another participant spoke about the benefits of a 'hole in the wall' café, which was both accessible and eliminated the need to navigate the building's interior. These features were not only seen as helpful, but in some cases vital supports:

> *...the lady used to save me a sandwich each day. It was much safer here than the other places that sold food. She probably never knew how much she helped me that first year.* (Participant 3 diary)

Another participant discussed the benefits of vending machines as alternative means of accessing food and drink on campus without the stress of entering the busy cafés, although noted that this was limited by the lack of healthy options available.

STRATEGIES

The formal and informal supports discussed above are often supplemented – or indeed, compensated for – by strategies that the students themselves devise to support their own learning experience at university. These include both coping mechanisms to support learning and wellbeing as well as tactics that are both subversive and assertive.

Coping mechanisms

Several participants discussed the use of personal devices including earplugs, stimming toys (props that support repetitive body movements – used as a self-calming mechanism) and other physical aids to reduce sensory overload and anxieties. Another common coping mechanism was the careful selection of seats in lecture theatres and tutorial rooms to reduce sensory stimuli and render the individual more invisible:

> *I tend to pick a spot all the time. Even in the lecture room I pick a chair, that's my chair.* (Participant 6 interview)

It can be quite a complex task to identify appropriate seats in response to the competing demands of different environmental stimuli and is compounded by the articulated overarching need to sit close to an 'escape route' by an exit door. Establishing a preferred spot helps to ease anxieties or reduce distractions. However, it can also lead to increased anxiety when the preferred seat is taken. Participant 6 described how she feels 'quite thrown' if her chosen spot is not available and the difficulty in attempting to find an appropriate alternative.

It is the option of escape rather than the need to actually escape that can be the critical factor in reducing anxiety. However, for one participant, the need to escape is more acute and deliberate strategies of disappearance are employed:

> *… my turn's coming up [in group discussion] so about the third person till I'm up I'll have to go to the toilet.* (Participant 6 interview)

Some lecture theatres and tutorials rooms were seen to be less anxiety-provoking as they more readily facilitated escape. One participant described a space that felt like 'prison' (participant 4 diary). The consequences of feeling trapped through a blocked or highly visible escape route are feelings of stress and an inability to focus and even self-exclusion from classes.

To expand their capacity to engage in university life on campus, some participants describe how they reduce sensory overload and associated anxieties by deliberately 'desensitising' themselves to environments over time. Strategies include attending campus when things are 'winding down' and arriving early to class to 'desensitise myself just to the room' (participant 6 interview). For this participant, desensitisation is not only borne out of necessity, but also of a 'conscious decision' to build resilience.

This kind of deliberate, but controlled, exposure to challenging situations is not always feasible, however, and managing the consequent stress can be difficult. In order to cope some participants have devised other mechanisms. One coping mechanism employed by participants is to study at home, either through minimising required contact time on campus or through distance education.

Tactics

Distance learning is not only a coping mechanism to reduce anxiety but is also a targeted strategy to optimise the learning experience in recognition of 'how I actually really learn' (participant 4 interview). Participants identified the learning approaches that worked best for them. These were not the same as the learning approaches promoted by lecturers. Participant 4 described in detail how he takes charge of his own learning journey by not attending lectures and by circumventing the University's online learning system (MyLO):

> *I got the RSS feeds off MyMedia – because the MyMedia service is hopeless... if you can navigate it properly, it actually gives you the feed identity. From that you can subscribe as if it's like some sort of podcast. It took me a while to figure out.… it is so much better because you can track … it tells you what the dates were … if it's been watched or not…. when it was last updated.… if it's good or if there's important points you can even put notes.* (Participant 4 interview)

Through his manipulation of the online learning system, this participant has created a much more effective mechanism to 'track' his learning, supporting the cognitive challenges experienced by students with ASD as discussed above. Technology is not only employed by this participant to enhance his learning within units he is enrolled in, but he also uses technology to access content in other units to pursue learning of his own interest. This apparently scattergun approach to learning is in fact a deliberate tactic that shifts emphasis from 'degree acquisition' to 'skills acquisition' (Participant 4 diary). While he feels that he has 'no choice', rather than accept defeat he takes charge of his own learning, and invents ways to use the system to his best advantage in terms of longer-term educational development and satisfaction.

Two other participants in the study, who are coming to terms with and even celebrating their autistic identity, also articulated this sense of control and of agency. Becoming familiar and comfortable with the diagnosis and the ability to 'declare' this to others was seen as being an effective strategy, both in fostering understanding and taking charge of their own support needs. Participant 6 stated that both having and declaring the diagnosis 'has really saved me. It's made uni life easier' (interview). While for

this participant this enables her to 'learn to make that fit with the neuro-typical world', for Participant 5, there is also the need to declare difference:

> *…you have to be assertive to be autistic and the world doesn't owe me anything and I don't like to play the victim. Where I just put it out there and say, look I'm autistic, I just need your assistance.* (Participant 5 interview)

5.0 CONCLUSIONS

5.1 OVERVIEW AND SUMMARY

The aim of this research is to identify targeted and effective improvements in support for higher education students with ASD in response to the unique experiences of this population. In recognition of the complex, multi-dimensional experiences of students with ASD, the research investigated the potential of disability supports, pedagogical strategies and built environment design factors to inform a holistic framework of support. A review of the literature on key issues and opportunities in supporting students with ASD in higher education, combined with a cross-sectional analysis of existing supports in Australian institutions and an in-depth analysis of the experience of students at one Australian university, reveals the commonalities, successes and gaps in the provision of support. Here we summarise these findings and identify opportunities to enhance supports for students with ASD in the higher education context in relation to holistic disability supports, pedagogical innovations and inclusive design solutions. We conclude by reflecting on the opportunities of the National Disability Insurance Scheme (NDIS) as a means to provide the individualised, flexible and ongoing support necessary so that students with ASD can flourish in higher education.

5.2 KEY OUTCOMES AND RECOMMENDATIONS

5.2.1 HOLISTIC DISABILITY SUPPORTS

Overall the provision of individualised assistance and support for the specific needs of students with ASD was a strong theme resonating within these research findings. The usage of a LAP, the traditional means by which Australian tertiary institutions implement the education standards for students with disability, was found to be the most prominent way students with ASD are supported, as well as regarded as an effective approach and identified within best practice examples. The requirement to take into consideration an individual's specific learning requirements and develop appropriate adjustments congruent with this underpins the ethos of a LAP. However, as the research identified, the effectiveness of the LAP is contingent upon its implementation within individual courses. This requires negotiation and can be limited by both the capacity for students with ASD to identify and articulate their needs and by the staff member's knowledge of and attitude to ASD. While the LAP itself may not

be the best means of outlining detailed support provisions, as specific requirements inevitably need to be negotiated in context, it could be supplemented by an information sheet outlining some of the common difficulties experienced by students with ASD to provide an initial framework for discussion and negotiation.

As illustrated in the best practice exemplars, LAPs are most effective when interwoven with other approaches. Supports that incorporate clear consistent communication, regular proactive contact, social and personal development and mentoring programs may augment the LAP's effectiveness in providing more individualised support for students with ASD. This need to extend traditional approaches to academic support for students with ASD is reflected in the literature (Dillon, 2007; Fleischer, 2012a; Ness, 2013; Smith, 2007). The prevalent practice of internal referral to case management and assistance with study and organisational skills indicates that institutions are responding to some of the challenges faced by students with ASD. Students have identified difficulties with study skills, time management, communication, social skills and anxiety (Hastwell et al., 2013b; Knott & Taylor, 2014). The provision of study and organisational skills and transition support, that includes the provision of an understanding of the tertiary learning environment, were mentioned most frequently as effective and best practice ways to support students.

Additionally it can be argued that core features of the peer mentoring approaches provided encompassed study and organisational skills, and transition support. However, despite these supports being identified most frequently as most effective and best practice, the proportion of institutions supporting students with specific transitional programs was the second lowest method currently utilised. Neither did study programs or peer mentoring programs feature strongly in ways institutions currently support students with ASD. Hence it appears that most institutions are recognising the need for this type of support and are addressing it through referrals to internal staff, rather than instigating specific programs.

Where specific programs are instigated, these tend to be limited to transition programs at the point of entering higher education. As revealed in the research, students with ASD can experience ongoing difficulties in response to multiple changing factors including new courses, new pedagogical approaches and different physical environments. Consequently, it is important that this support persists throughout the student's life course in higher education.

Implicit in approaches that use transitional and mentoring programs is the fostering of social connections and the utilisation of a proactive approach. This study, along with previous research, has identified both these factors as being beneficial to the wellbeing and academic outcomes of students with ASD (Fleisher, 2012a; Knott & Taylor, 2014; Macleod & Green, 2009; McLeod & Harrison, 2013). As Macleod & Green (2009) argue, often by the time a need has been identified academic achievement

and student wellbeing has already been adversely affected. This study therefore supports the emerging evidence in the literature for peer mentoring programs. Further research on a comparison between mentoring programs, the approaches within institutions that would best supplement this approach, and the effectiveness of the approaches in terms of student experience and academic progression is required.

Additionally, these findings favour the call for the provision of support that extends beyond academic related skills. Social skills, self-management and advocacy and personal development should be integral to the support for students with ASD (Knott & Taylor, 2013). Similar to the provision of transition programs and study and organisation programs it appears that few institutions are implementing programs to provide these supports, but those that do regard them as highly effective ways to support their students.

It is recognised through the literature and this study that providing direct support to students is only one side of the coin, and effective support also requires the provision of professional development and supports to teaching and professional staff within institutions (Knott & Taylor, 2014; McKeon, Aspern & Zager, 2013; Morrrison, Sansosti, & Hadley, 2009). Currently the support provided to staff working with students with ASD is primarily through consultancy regarding inclusive teaching practices. This is a core role of disability practitioners within tertiary institutions, and is often an integral part of the development of a LAP. Further support is provided through web-based and non-web-based resources and information. However, specific ASD training and resources for staff are less common. Whilst the education of staff is encouraged, little evidence exists to determine the most effective mechanisms for the provision of supports. Further research is required to ascertain from academic, teaching, professional and administrative staff their current knowledge, and the types of supports required to increase their skills in working with students with ASD. Moreover, it is important that this is combined with efforts to develop broader public awareness of ASD and foster a culture in which difference is not only recognised but also celebrated.

5.2.2 PEDAGOGICAL INNOVATIONS

In bringing together the key findings of the study in terms of learning and teaching for higher education students with ASD, several themes emerge that have been identified in previous research literature. In particular, this study has highlighted how the special and intense interests that characterise individuals with ASD can provide motivation for study as well as distraction from it. The self-directed photography data and interview responses extend previous research in showing how individuals who are intellectually capable can find significant challenges in understanding the 'hidden curriculum' of social interaction (particularly in collaborative learning tasks) and in navigating learning experiences which involve close

social proximity and exposure. The novel approach of this study, particularly its interest in the built environment and students' sensory experiences, has shed new light on the ways in which the physical layout of learning spaces affects the participation, engagement, and achievement of higher education students with ASD.

Three key pedagogical implications arise from this study. First, higher education students with ASD should be provided with multiple options for accessing content and engaging in the learning experiences. One size does not fit all. Even among the relatively small sample of students in this study, there were marked contrasts between individuals with ASD in terms of their learning preferences. Some students found online or distance learning to be extremely beneficial, while others found this approach to study unmanageable. Students differed in their response to unstructured, student-directed learning in comparison to incremental, structured learning (some preferring the former, others the latter). Open plan classrooms excited the imagination and supported the social interaction of some respondents, while others found such arrangements confusing, preferring single desks facing a clear 'front' of the room. With this diversity of students on the autism spectrum, not to mention the broader population of students, Universal Design for Learning (UDL) principles may provide a useful pedagogical framework in the higher education sector (Hart, Grigal, & Weir, 2010; Taylor & Colvin, 2013).

Second, greater awareness and understanding of higher education students with ASD should be promoted, particularly among teaching staff. Participants underscored the value of having lecturers and tutors who had a sound knowledge of ASD and/or a willingness to learn about the individual needs of the student. Participants in this study illustrated how teachers' attitudes towards individuals with ASD and their concept of 'disability' influenced their actions in response to students' learning characteristics. Indeed, the findings of this research are consistent with the recommendation of Beardon et al. (2009) who argue that addressing the needs of higher education students with ASD is dependent upon a shift towards a more aware and more inclusive culture in higher education settings generally.

Third, higher education students with ASD should exercise agency and self-management of their learning, and be supported in doing so. This complements the recommendation of Camarena & Sarigiani (2009) and Hart, Grigal, & Weir (2010) regarding the development of students' self-advocacy skills. The self-directed photography and interview data of this survey provide rich examples of the ways in which students resolve the mismatches between the learning environment and their individual characteristics. Notable examples included the use of exit and avoidance strategies, deliberate and progressive desensitisation experiences, and the utilisation of information and communication technologies. Clearly, the exercise of students' agency can be facilitated by the institution and its teaching staff in the layout of learning spaces, the delivery of content, the opportunities for structured (but not forced) social interaction, and though an optimism regarding each student's potential.

5.2.3 INCLUSIVE DESIGN SOLUTIONS

The built environment can influence and enable choice but it can also constrain it. It is important that the design of both learning spaces and the informal spaces on campus are considered in this context. The learning environment does not end with the classrooms and lecture theatres and likewise, the accommodation of social nuance does not cease at the classroom door. Campus spaces need to be considered holistically.

This research has demonstrated the extent to which the built environment affects academic outcomes as well as social inclusion and the broader health and wellbeing of students with ASD in higher education. Impacts can range from reduced cognitive functioning, sickness that can result in incapacitation for hours or even days, and self-exclusion from classes resulting in reduced academic performance and even failure to graduate. The issues experienced by students are not limited to learning and teaching spaces, but can affect access to all campus facilities including the library, social spaces and cafeterias. Key issues identified in the research related to sensory overload from acoustic and visual stimuli, difficulties in navigation of both campus and online environments and problems of social engagement including both a lack of opportunities for structured social encounters and the ability to avoid or escape from of social encounters.

Addressing these problems does not require a radical redesign and major investment in campus infrastructure. Small-scale interventions, such as the removal of ticking clocks and the replacement of fluorescent lighting with LEDs during building upgrades, can make a substantial difference in reducing acoustic and visual sensory overload.

Arguably the recent design trends in educational settings to more dynamic, interactive, acoustically live and visually stimulating environments are compounding the problem for students with ASD. While we are not suggesting that this approach should be abandoned in favour of more sensory neutral learning environments, it is important that alternative provisions are made that enable choice and retreat from the hyper-stimulating environments. This does not necessarily require dedicated facilities for students with disabilities, although these do offer benefits and are arguably essential as ‘safe’ spaces for particular medical conditions. More broadly, however, such facilities should be considered as part of the whole campus environment for the benefit of all students. Opportunities include quiet learning spaces, ‘hole-in-the-wall’ cafés and even vending machines that offer a broader range of healthy choices.

Threshold spaces and particularly external spaces on campus offer valuable opportunities for this kind of retreat. Key features of these spaces include quiet environments with visual access to natural features, daylight or soft electric lighting, muted, solid colours, comfortable couches, easy to navigate, bounded but not enclosed and with easy access to water. Again these do not necessarily need to be added to

existing campus. Many such spaces exist already and can be identified, protected and promoted to students as quiet retreat areas. For students with ASD, awareness of such 'informal' supports could be facilitated by campus familiarisation as part of transition programs.

The location of these spaces is also of critical importance. The provision of quiet learning spaces in the library is futile if the library entrance is inaccessible as a hyper-sensory environment complete with coffee carts. Many retreat spaces need to be immediately accessible from students' classes. Even sensory calming spaces within learning environments – 'spaces within spaces' – facilitates continued, albeit passive, engagement in activities without the need for total retreat. What is required is a larger range of smaller scale environments distributed across the campus to improve choice and accessibility.

The design of larger learning spaces, such as lecture theatres and seminar rooms, also needs to consider opportunities for discrete escape. This is generally good design practice as it enables entry and exit with minimal intrusion and distraction for lecturers and students. Further, the design of seminar and tutorial spaces, including furniture and layout, needs to consider opportunities for structured social interaction in smaller settings – fostering rather than forcing social engagement. Consideration also needs to be given to the design of social amenities that enable students with ASD to participate in social life on campus whether actively in smaller social settings, or passively through the ability to observe campus activities while being 'hidden from view'.

The design of campus and learning environments also needs to consider legibility so that students with ASD can more readily 'make sense' of the environment. Visual cues can assist in providing clearer information on where to go and what to do, avoiding problems of disorientation. This is more broadly applicable to the online as well as the physical environment enabling improved accessibility in navigating the complexities of the administrative and academic structures and content. Such visual cues may become even more important in the context of the transformation of learning environments in response to new pedagogies where multiple activities can happen simultaneously in one space.

These issues and design opportunities need to be recognised and included in future design guidelines for higher education facilities. Issues of accessibility cannot be limited to, or conflated with, issues of mobility and physical impairment. While it is not possible to address the full complexity and idiosyncrasies of the needs of students with ASD in design guidelines, embedding at least broader aspirations of inclusion is an important first step.

Taken together, the disability supports, pedagogical innovations and inclusive design solutions offer a holistic framework of support for students with ASD in higher education. Many of these initiatives can be operationalised within higher education institutions within existing frameworks of support and resourcing capabilities. However, given the unique, individualised support needs of students with ASD it

is unlikely that these can be comprehensively covered within the increasingly resource-constrained environment in higher education. In the last section of this report, we examine the opportunities of the NDIS to provide the individualised, flexible and ongoing support necessary for effective participation of students with ASD in higher education.

5.3 IMPLICATIONS FOR NDIS

The National Disability Insurance Scheme (NDIS) is delivered under the auspices of the National Disability Insurance Agency and was introduced on 1st July 2013 following a Productivity Commission report that identified significant funding and support gaps in the existing disability support system (Buckmaster, 2012). Support packages delivered under the NDIS are based on what is 'reasonable and necessary' for an individual who meets the eligibility requirements (National Commission of Audit, 2014). To be eligible, participants must have a permanent (or likely to be permanent) intellectual, cognitive, neurological, sensory or physical impairment, or impairment due to a psychiatric condition and this impairment results in a 'substantially reduced capacity' to undertake activities such as communication, social interaction, leaning, mobility, self-care or self-management (Office of Parliamentary Counsel, 2014).

In relation to higher education, the NDIS will fund 'supports that enable participants to engage in higher education or VET courses which are related to the participant's disability' (National Disability Insurance Scheme, 2014). These supports include: disability related personal care on campus (eg. assistance with eating or self-care); assisting with transport to and from campus required due to the person's disability; aids and equipment such as wheelchair, communication device or hearing aid; and intensive/specialised support to enable transition into or out of higher education (National Disability Insurance Scheme, 2014).

The parameters around some of the supports provided in relation to higher education under the NDIS (e.g. transition support) remain vague, although the support explicitly excludes areas where the education provider or participant/family is deemed to be responsible, including the provision of teachers, learning assistants, educational resources, computers, textbooks, course fees and reasonable adjustments to the curriculum (National Disability Insurance Scheme, 2014). Limited information is provided about support provided under the NDIS in relation to the physical or built environment on campus, although the education provider has clear responsibility for adjustments such as ramps and hoists to accommodate students with physical disabilities (National Disability Insurance Scheme, 2014). The NDIS will not fund supports for students that are deemed to be the responsibility of the education provider, even if they do not provide the support.

While changes to the built environment to accommodate the needs of students with ASD clearly fall within the responsibility of the higher education provider, there are a number of areas where those students who meet the eligibility requirements under the NDIS could be better supported to successfully complete higher education.

Higher education providers may include peer mentoring programs in their suite of support for all students, but the findings presented in this report suggest that the peer mentoring support required by a student with ASD is more intensive and of greater duration. An appropriately trained and supervised peer mentor for a student with ASD could provide support with physical and technological orientation, time management, way finding and navigation and also assume a liaison and advocacy role that would be additional to the support provided by disability services, academics and learning assistants. Broadening of the peer mentor role to specifically meet the needs of a student with ASD is an area that could be funded relatively inexpensively as an additional disability related support under the NDIS, but with the potential to have a significant impact on the retention and participation of a student with ASD.

The need for intensive/specialised support to enable transition into or out of higher education has been well established in the literature and justifies the inclusion of this in the support funded under the NDIS. However, our research suggests that students with ASD in higher education require additional support with transition beyond those two time points. Transitioning between different units, semesters, courses, locations and modes of teaching – 'micro transitions' - may pose significant challenges for students with ASD and contribute to a student failing to complete a subject or a course.

The transition to higher education and first semester of study is a time when students with ASD require significant support. Our research suggests that for these students to be successful in higher education, there is a need for ongoing support throughout the life of their course that extends beyond the provision of academic support to include communication, independent living, self-management and advocacy skills, and that this support is clearly disability-related. Guidelines outlining the types and levels of support offered to students with a disability in higher education tend to focus on physical disability. The same can be broadly said with regard to the support for students in higher education under the NDIS. Clarification of the type of support available to higher education students with ASD under the NDIS that takes into account the unique (but less visible) disability-related needs of this population has the potential to assist these students to complete their higher education study and thus increase the likelihood of their future employment and economic independence.

Finally, it must be recognised that this research is based on the experience of a small group of students who have successfully managed to access and remain in higher education. If a more comprehensive understanding of the support needs of students with ASD is to be developed, then it is important that

future research examine retention rates for students with ASD and include the experiences of a broader range of participants including individuals with ASD who have failed to access higher education despite academic competency and interest, and individuals who have entered higher education but failed to graduate.

REFERENCES

Ackles, L., Fields, H., & Skinner, L. 2013, A collaborative support model for students on the autism spectrum in college and university housing, *The Journal of University and College Student Housing,* vol. 40, no. 1, pp. 200-212.

Adreon, D. & Durocher, J. S. 2007, Evaluating the college transition needs of individuals with high-functioning autism spectrum disorders, *Intervention in School and Clinic,* vol. 42, no. 5, 271-279.

Ahrentzen, S. & Steele, K. 2009, *Advancing Full Spectrum Housing: Designing for adults with Autism Spectrum Disorders*, Herberger Institute School of Architecture and Landscape Architecture, Arizona State University, viewed 6 January 2015, https://stardust.asu.edu/docs/stardust/advancing-full-spectrum-housing/full-report.pdf/

American Psychiatric Association, 2013, *Diagnostic and statistical manual of mental disorders: DSM-V,* 5th edn, American Psychiatric Association, Washington, DC.

Ames, M. E., McMorris, C. A., Alli, L. N., & Bebko, J. M. 2015, Overview and evaluation of a mentorship program for university students with ASD, *Focus on Autism and Other Developmental Disabilities*, published online April 27 2015.

Australian Government 2005, Disability Standards for Education 2005, viewed 6 January 2015, https://www.comlaw.gov.au/Series/F2005L00767

Australian Vice Chancellors' Committee 2006, *Guidelines relating to Students with a Disability*, 2nd edn., Australian Vice Chancellors' Committee (AVCC), viewed 20 January 2015, http://www.utas.edu.au/__data/assets/pdf_file/0007/118969/avcc_disability_guidelines.pdf.

Balmer, C., Griffiths, F., & Dunn, J. 2015, A review of the issues and challenges involved in using participant-produced photographs in nursing research, *Journal of Advanced Nursing*, vol.17, no.7, pp. 1726–1737.

Barnhill, G. P. 2014, Supporting students with Asperger Syndrome on college campuses: current practices, *Focus on Autism and Other Developmental Disabilities*, published online March 10 2014.

Baumers, S. & Heylighen, A. 2010a, *Beyond the Designers' View: How people with Autism experience space*. Paper presented at the Conference of the Design Research Society, Montreal.

Baumers, S. & Heylighen, A. 2010b, 'Harnessing different dimensions of space. The Built Environment in Auti-Biographies', in P. Langdon, J. Clarkson & P. Robinson (eds.), *Designing Inclusive Interactions*, pp. 13-23, Springer-Verlag, London.

Beardon, L., Martin, N., & Woolsey, I. 2009, What do students with Asperger Syndrome or High Functioning Autism want at college or university? (in their own words), *Good Autism Practice,* vol.10 , no. 2, pp.35-43.

Beaver, C. 2006, *Designing Environments for Children and Adults with ASD*, paper presented at the Autism Safari 2nd World Autism Congress and Exhibition.

Bebko, J., Schroeder, J. & Ames, M. (eds) 2011, *A Mentoring Program for Students with Asperger and ASDs*, viewed 6 November 2015 http://www.counselling.net/jnew/pdfs/handbooks-munuals-guides/YORK%20UNIVERSITY,%20A%20Mentoring%20Program%20for%20Students%20with%20Asperger%20and%20ASDs.pdf

Bogdashina, O. 2010, *Autism and the edges of the known world: Sensitivities, language, and constructed reality,* Jessica Kingsley Publishers, London.

Bogdashina, O. 2003, *Sensory Perceptual Issues in Autism and Asperger Syndrome*, Jessica Kingsley Publishers, London.

Bozikovic, A. 2015, 'Design empathy' builds inclusive spaces for people with autism', *The Globe and Mail*, 15 April, viewed: 24 April 2015 http://www.theglobeandmail.com/life/home-and-garden/design/design-empathy-builds-inclusive-spaces-for-people-with-autism/article23966012/

Brand, A. 2010, *Living in the Community - Housing Design for Adults with Autism*, Helen Hamlyn Centre, Royal College of Art, London.

Buckmaster, L. 2012, Budget review 2012-2013: National Disability Insurance Scheme, viewed: 13 October 2015 http://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/rp/BudgetReview201213/NDIS.

Bugos, E., Frasso, R., FitzGerald, E., True, G., Adachi-Mejia, A. M., & Cannuscio, C. 2014, Practical guidance and ethical considerations for studies using photo-elicitation interviews, *Preventing Chronic Disease*, vol.11, pp. 1-9.

Camarena, P. M. & Sarigiani, P. A. 2009, Postsecondary educational aspirations of high-functioning adolescents with autism spectrum disorders and their parents, *Focus on Autism and Other Developmental Disabilities,* vol. 24 no. 2, pp. 115-128.

Chiang, H., Cheung, Y. K., Hickson, L., Xiang, R., & Tsai, L. Y. 2012, Predictive factors of participation in postsecondary education for high school leavers with autism, *Journal of Autism and Developmental Disorders,* vol. 42, no. 5, pp. 685-696.

Chown, N. & Beavan, N. 2012, Intellectually capable but socially excluded? A review of the literature and research on students with autism in further education, *Journal of Further and Higher Education,* vol. 36, no. 4, pp. 477-493.

Davidson, J. 2010, 'It cuts both ways': a relational approach to access and accommodation for autism, *Social Science & Medicine,* vol. 70, no. 2, pp. 305-312.

Davidson, J. & Henderson, V. L. 2010, 'Travel in parallel with us for a while': sensory geographies of autism, *The Canadian Geographer / Le Géographe Canadien,* vol. 54, no. 4, pp. 462-475.

Davidson, J. & Smith, M. 2009, Autistic autobiographies and more-than-human emotional geographies, *Environment and Planning D: Society and Space,* vol. 27, no. 7, pp. 898-916.

Dillon, M. R. 2007, Creating supports for college students with Asperger Syndrome through collaboration, *College Student Journal,* vol. 41, no. 2, pp. 499-504.

Dipeolu, A. O., Storlie, C., & Johnson, C. 2014, Transition to College and Students with High Functioning Autism Spectrum Disorder: Strategy Considerations for School Counselors, *Journal of School Counseling,* vol.12, no. 11, 38.

Downing, J. 2014a, Applied or denied? The eLearning experience of an autistic, mature-aged university student, *International Journal of Cyber Ethics in Education,* vol. 3, no. 2, pp. 1-15.

Downing, J. 2014b, 'Obstacles to my learning': A mature-aged student with autism describes his experience in a full online course, *International Studies in Widening Participation,* vol. 1, no. 1, pp. 15-27.

Dunn, W., Myles, B. S., & Orr, S. 2002, Sensory processing issues associated with Asperger Syndrome: a preliminary investigation, *The American Journal of Occupational Therapy,* vol. 56, no. 1, pp. 97- 102.

Fleischer, A. 2012a, Alienation and struggle: everyday student-life of three male students with Asperger Syndrome, *Scandinavian Journal of Disability Research,* vol. 14, no. 2, pp. 177-194.

Fleischer, A. 2012b, Support to students with Asperger Syndrome in higher education — the perspectives of three relatives and three coordinators, *International Journal of Rehabilitation Research*, vol. 35, no. 1, pp. 54-61.

Gaines, K., Curry, Z., Shroyer, J., & Amor, C. 2010, *Brain Compatible Learning Environments for Students with Autism Spectrum Disorders*. Paper presented at the Interior Design Educators Council 2010 Annual Conference, Atlanta, GA.

Gardiner, E., & Iarocci, G. 2014, Students with autism spectrum disorder in the university context: peer acceptance predicts intention to volunteer, *Journal of Autism and Developmental Disorders,* vol. 44, no. 5, pp. 1008-1017.

Gelbar, N., Smith, I., & Reichow, B. 2014, Systematic review of articles describing experience and supports of individuals with autism enrolled in college and university programs, *Journal of Autism and Developmental Disorders*, vol. 44, no. 10, pp. 2593-2601.

Glennon, T. J. 2001, The stress of the university experience for students with Asperger Syndrome, *Work: A Journal of Prevention, Assessment and Rehabilitation,* vol. 17, no. 3, pp. 183-190.

Gobbo, K. & Shmulsky, S. 2014, Faculty experience with college students with autism spectrum disorders: a qualitative study of challenges and solutions, *Focus on Autism and Other Developmental Disabilities*, vol. 29, no. 1, pp. 13-22.

Grandin, T. 2006, *Thinking in Pictures: and other reports from my life with autism* (2nd ed.), Vintage, New York.

Hagner, D., Kurtz, A., Cloutier, H., Arakelian, C., Brucker, D. L., & May, J. 2012, Outcomes of a family-centered transition process for students with autism spectrum disorders, *Focus on Autism and Other Developmental Disabilities,* vol. 27, no. 1, pp. 42-50.

Hart, D., Grigal, M., & Weir, C. 2010, Expanding the paradigm: postsecondary education options for individuals with autism spectrum disorder and intellectual disabilities, *Focus on Autism and Other Developmental Disabilities*, vol. 25, no. 3, pp. 134-150.

Hastwell, J., Harding, J., Martin, N., & Baron-Cohen, S. 2013a, *Asperger Syndrome Student Project, 2009-12: Final Project Report, June 2013,* The Disability Resource Centre, University of Cambridge, Cambridge.

Hastwell, J., Harding, J., Martin, N., & Baron-Cohen, S. 2013b, Giving Cambridge university students with Asperger Syndrome a voice: a qualitative, interview- based study towards developing a model of best practice, *Good Autism Practice,* vol. 13, no. 1, pp. 56-63.

Hendricks, D. R., & Wehman, P. 2009, Transition from school to adulthood for youth with autism spectrum disorders: review and recommendations, *Focus on Autism and Other Developmental Disabilities*, vol. 24, no. 2, pp. 77-88.

Henry, C. 2011a, Designing for autism: the 'neuro-typical' approach, *ArchDaily*, (3 Nov), viewed 24 April 2015, http://www.archdaily.com/181402/designing-for-autism-the-neuro-typical-approach/

Henry, C. 2011b, Designing for autism: spatial considerations, *Arch Daily*, viewed 28 January 2013, http://www.archdaily.com/179359/designing-for-autism-spatial-considerations.

Hewitt, L. E 2011, Perspectives on support needs of individuals with autism spectrum disorders: transition to college, *Topics in Language Disorders*, vol. 31, no. 3, pp. 273-285.

Hill, L. 2014, 'Some of it I haven't told anybody else': Using photo elicitation to explore the experiences of secondary school education from the perspective of young people with a diagnosis of Autistic Spectrum Disorder, *Educational & Child Psychology*, vol. 31, no. 1, pp. 79 - 89.

Kinnaer, M., Baumers, S., & Heylighen, A. 2014, 'How do People with Autism (Like to) Live?', In P. M. Langdon, J. Lazar, A. Heylighen & H. Dong (eds.), *Inclusive Designing – Joining Usability, Accessibility, and Inclusion,* pp. 175-185, Springer International Publishing, Switzerland.

Knott, F. & Taylor, A. 2014, Life at university with Asperger Syndrome: a comparison of student and staff perspectives, *International Journal of Inclusive Education*, vol. 18, no. 4, pp. 411-426.

Koshy, P. 2014, *Student Equity Performance in Higher Education: 2007 to 2012*, National Centre for Student Equity in Higher Education (NCSEHE), Curtin University, Perth.

Longtin, S. 2014a, Interdisciplinary support services for students with autism spectrum disorders, *Journal of Postsecondary Education and Disability*, vol. 27, no. 3, pp. 333–342.

Longtin, S. 2014b, Using the college infrastructure to support students on the autism spectrum, *Journal of Postsecondary Education and Disability*, vol. 27, no. 1, pp. 63-72.

Lovett, B. J., Nelson, J. M., & Lindstrom, W. 2015, Documenting hidden disabilities in higher education: analysis of recent guidance from the association on higher education and disability (AHEAD), *Journal of Disability Studies*, vol. 26, no. 1, pp. 44-53.

MacLeod, A. 2010, 'Welcome to my first rant!' Report on a participatory pilot project to develop the 'AS portal', an online peer support network for higher education students on the autism spectrum, *Journal of Assistive Technologies,* vol. 4, no. 1, pp. 14-24.

MacLeod, A. & Green, S. 2009, Beyond the books: case study of a collaborative and holistic support model for university students with Asperger Syndrome, *Studies in Higher Education,* vol. 34, no. 6, pp. 631-646.

Madriaga, M. 2010, 'I avoid pubs and the student union like the plague': students with Asperger Syndrome and their negotiation of university spaces, *Children's Geographies*, vol. 8, no. 1, pp. 39-50.

Madriaga, M. & Goodley, D. 2009, Moving beyond the minimum: socially just pedagogies and Asperger's Syndrome in UK higher education, *International Journal of Inclusive Education,* vol. 14, no. 2, pp. 115-131.

Martin, N. 2006, Strategies which increase the likelihood of success at university of students with Asperger Syndrome, *Good Autism Practice*, vol. 7, no. 2, pp. 51-60.

Matthews, N., Ly, A., & Goldberg, W. 2015, College students' perceptions of peers with autism spectrum disorder, *Journal of Autism and Developmental Disorders*, vol. 45, no. 1, pp. 90-99.

McKeon, B., Alpern, C. S., & Zager, D. 2013, Promoting academic engagement for college students with autism spectrum disorder, *Journal of Postsecondary Education and Disability*, vol. 26, no. 4, pp. 353-366.

McLeod, H. & Harrison, J. 2013, Assisting students with Asperger's Syndrome to transition more smoothly into academic life at university and into university accommodation, *Journal of the Australia and New Zealand Student Services Accommodation,* vol. 41, pp. 35-45.

Mirenda, P. & Iacono, T. (eds.), 2009, *Autism Spectrum Disorders and AAC*, Paul H. Brookes, Baltimore.

Mishchenko, E. D. 2013, Towards inclusive campus environments: evidence-based research of a university campus, *Open House International*, vol. 38, no. 1, pp. 31-42.

Morrison, J. Q., Sansosti, F. J., & Hadley, W. M. 2009, Parent perceptions of the anticipated needs and expectations for support for their college-bound students with Asperger's Syndrome, *Journal of Postsecondary Education and Disability*, vol. 22, no. 2, pp. 78-87.

Mostafa, M. 2014, Architecture for autism: autism ASPECTSS™ in school design, *International Journal of Architectural Research*, vol. 8, no. 1, pp. 143-158.

Mostafa, M. 2013, Expanding normal: towards a more inclusive approach to designing the built environment, *Open House International*, vol. 38, no. 1, pp. 4-6.

Mostafa, M. 2008, An architecture for autism: concepts of design intervention for the autistic user, *International Journal of Architectural Research*, vol. 2, no. 1, pp. 189-211.

Myers, D. and Associates 2010, Housing Options for Adults with Autism Spectrum Disorder, *Pennsylvania Department of Public Welfare, Bureau of Autism Services*, Pennsylvania.

Myles, B. S., Dunn, W., Rinner, L., Reese, M., Huggins, A., & Becker, S. 2004, Sensory issues in children with Asperger Syndrome and autism, *Education and Training in Developmental Disabilities*, vol. 39, no. 4, pp. 283-290.

Mynatt, B. S., Gibbons, M. M., & Hughes, A. 2014, Career development for college students with Asperger's Syndrome, *Journal of Career Development*, vol. 41, no. 3, pp. 185-198.

National Commission of Audit 2014, *Towards Responsible Government. Appendix to the Report of the National Commission of Audit – Volume 1.* Viewed: 13 October 2015 http://www.ncoa.gov.au/report/appendix-vol-1/index.html

National Disability Insurance Scheme 2014, *Mainstream interface: Higher education and vocational education and training.* Viewed: 13 October 2015 http://www.ndis.gov.au/sites/default/files/documents/fact_sheet_supports_ndis_fund_higher_education.pdf

Ness, B. M. 2013, Supporting self-regulated learning for college students with Asperger Syndrome: exploring the 'strategies for college learning' model, *Mentoring & Tutoring: Partnership in Learning*, vol. 21, no. 4, pp. 356-377.

Nevill, R. A. & White, S. 2011, College students' openness toward autism spectrum disorders: improving peer acceptance, *Journal of Autism and Developmental Disorders*, vol. 41, no. 12, pp. 1619-1628.

Office of Parliamentary Counsel 2014, *National Disability Insurance Scheme Act 2013*, No. 20, 2013 as amended. Canberra. Viewed 13 October 2015. https://www.comlaw.gov.au/Details/C2014C00386/Html/Text#_Toc393267509

Owen, C. & McCann, D. 2013, 'Picturing home: self-directed photography as a lens to explore the home environment in the care of children with autism spectrum disorder', *7th Australasian Housing Researchers' Conference: Refereed Proceedings*, 6-8 February 2013, Fremantle, Australia, pp. 1-18.

Pillay, Y. & Bhat, C. S. 2012, Facilitating support for students with Asperger's Syndrome, *Journal of College Student Psychotherapy*, vol. 26, no. 2, pp. 140-154.

Pugliese, C. & White, S. 2014, Brief report: problem solving therapy in college students with autism spectrum disorders: feasibility and preliminary efficacy, *Journal of Autism and Developmental Disorders*, vol. 44, no. 3, pp. 719-729.

Rayner, C., Denholm, C. & Sigafoos, J. 2009, Video-based intervention for individuals with autism: key questions that remain unanswered, *Research in Autism Spectrum Disorders*, vol. 3, no. 2, pp. 291-303.

Redpath, J., Kearney, P., Nicholl, P., Mulvenna, M., Wallace, J., & Martin, S. 2013, A qualitative study of the lived experiences of disabled post-transition students in higher education institutions in Northern Ireland, *Studies in Higher Education,* vol. 38, no. 9, pp. 1334-1350.

Ritchie, J. & Spencer, L. 1994, Qualitative data analysis for applied policy research. In A. Bryman, R. G. Burgess (eds.), *Analyzing Qualitative Data*, Routledge, London, pp. 173 – 194.

Roberts, K. D. 2010, Topic areas to consider when planning transition from high school to postsecondary education for students with autism spectrum disorders, *Focus on Autism and Other Developmental Disabilities*, vol. 25, no. 3, pp. 158-162.

Ryan, R.M. & Deci, E.L. 2000, Self-determination theory and the facilitation of intrinsic motivation, social development and well-being, *American Psychologist*, vol. 55, no. 1, pp. 68-78.

Sánchez, P. A., Vázquez, F. S., & Serrano, L. A. 2011, 'Autism and the Built Environment', in T. Williams (ed.), *Autism Spectrum Disorders - From Genes to Environment*, InTech, Croatia.

Shmulsky, S. & Gobbo, K. 2013, Autism spectrum in the college classroom: strategies for instructors, *Community College Journal of Research and Practice*, vol. 37, no. 6, pp. 490-495.

Smith, C. P. 2007, Support services for students with Asperger's Syndrome in higher education, *College Student Journal*, vol. 41, no. 3, pp. 515-531.

Swallow, V., Lambert, H., Santacroce, S., & Macfadyen, A. 2011, Fathers and mothers developing skills in managing children's long-term medical conditions: how do their qualitative accounts compare? *Child: Care, Health and Development*, vol.37, no.4, pp. 512-523.

Taylor, A. & Knott, F. 2007, Developing a diagnostic and support service for students with Asperger Syndrome at university, *Good Autism Practice*, vol. 8, no. 2, pp. 9-16.

Taylor, C. M. & Colvin, K. L. 2013, Universal design: a tool to help college students with Asperger's Syndrome engage on campus, *About Campus*, vol. 18, no. 3, pp. 9-15.

VanBergeijk, E. & Cavanagh, P.K. 2012, Brief report: new legislation supports students with intellectual disabilities in post-secondary funding, *Journal of Autism and Developmental Disorders,* vol. 42, no. 11, pp. 2471-2475.

VanBergeijk, E., Klin, A., & Volkmar, F. 2008, Supporting more able students on the autism spectrum: college and beyond, *Journal of Autism and Developmental Disorders*, vol. 38, no. 7, pp. 1359-1370.

Vázquez, F. S. & Torres, A. S. 2013, 'Autism and Architecture', in M. Fitzgerald (ed.), *Recent Advances in Autism Spectrum Disorders - Volume II*, pp. 177-186, http://cdn.intechopen.com/pdfs-wm/42147.pdf

Wang, C. & Burris, M. A. 1994, Empowerment through photo novella: portraits of participation, *Health Education Quarterly,* vol. 21, no. 2, pp. 171-186.

Warren, S. 2005, Photography and voice in critical qualitative management research, *Accounting, Auditing & Accountability Journal*, vol. 18, no. 6, pp. 861-882.

Wei, X., Christiano, E. R., Yu, J. W., Blackorby, J., Shattuck, P., & Newman, L. A. 2014, Postsecondary pathways and persistence for STEM versus non-STEM majors: among college students with an autism spectrum disorder, *Journal of Autism and Developmental Disorders,* vol. 44, no, 5, pp. 1159-1167.

Wenzel, C. & Rowley, L. 2010, Teaching social skills and academic strategies to college students with Asperger's Syndrome, *Teaching Exceptional Children*, vol. 42, no. 5, pp. 44-50.

Zager, D. & Alpern, C. S. 2010, College-based inclusion programming for transition-age students with autism, *Focus on Autism and Other Developmental Disabilities*, vol. 25, no. 3, pp. 151-157.

Zeedyk, S. M., Tipton, L. A., & Blacher, J. 2014, Educational supports for high functioning youth with ASD: the postsecondary pathway to college, *Focus on Autism and Other Developmental Disabilities* (Early online), viewed 14 October 2015, http://foa.sagepub.com/content/early/2014/03/21/1088357614525435.full.pdf+html

APPENDICES

Appendix 1: Austed Survey Questionnaire

2 Supporting students with Autism Spectrum Disorder (ASD) in Higher Education

*** 1. Please indicate the type of institution you work for.**

- ◯ University
- ◯ TAFE
- ◯ Combination of University and VET courses
- ◯ Other (please specify)

*** 2. How many students with disclosed Autism Spectrum Disorder (ASD) does your institution currently support? (If unknown please respond with "unknown")**

*** 3. What type of support does your institution provide students with ASD? (Please tick all that apply).**

- ☐ Provision of secondary to tertiary education transitional programs for students with ASD
- ☐ Learning Access Plan (or equivalent) developed by your institution's disability practitioner
- ☐ Learning Access Plan (or equivalent) developed by other staff
- ☐ Peer mentoring program for students with disabilities
- ☐ Peer mentoring program specifically for students with ASD
- ☐ Communication and study skills training for students with ASD
- ☐ Internal referral to appropriate staff to support study skills and organisation
- ☐ Internal referral to counselling staff
- ☐ Case management by student support staff
- ☐ External referral to community service provider for general support
- ☐ External referral to counselling
- ☐ Web-based ASD specific resources/information for students
- ☐ Non-web-based ASD specific resources/information for students

- [ ] Web-based general disability resources/information for students
- [ ] Non-web-based general disability resources/information for students

Other (please specify)

*** 4. What type of support does your institution provide to staff working with students with ASD? (Please tick all that apply).**

- [ ] Consultancy with academic/teaching staff regarding inclusive teaching practices
- [ ] Provision of ASD specific training to academic/teaching staff
- [ ] Provision of ASD specific training to professional/administrative staff
- [ ] Web-based ASD specific resources/information for staff
- [ ] Non-web-based ASD specific resources/information for staff
- [ ] Web-based general disability resources/information for staff
- [ ] Non-web-based general disability resources/information for staff

Other (please specify)

5. In your opinion what are the most effective ways to support students with ASD in their studies?

6. Do you have any examples of good practice specific to supporting students with ASD from your institution?

7. Would you be willing to be contacted to provide further information about your institution's support for students with ASD?

- ◯ Yes
- ◯ No

8. If yes, please provide your name and contact details in the space below

Done

Appendix 2.1: Photovoice Diary

Supporting students with
Autism Spectrum Disorder in Higher Education
Project

UTAS

Photo Diary Booklet

Use this diary to record information about the photos you took with the project camera.

- We need you to write down what can be seen in each picture. (This information will help us to know which photo you are writing about.)
- There are some sentence beginnings to help you get started with writing about each photo. Complete as many of these sentences for each photo as you want.
- It's OK to ask someone for help with making the diary.
- You can write as much as you want to.
- When you have written about all of your photos we need you to put this diary and the camera in the envelope provided.
- Post the envelope to Dr Ceridwen Owen.
  (The envelope has the correct stamps and address on it.)

Participant Number: _____

(We will use this number instead of your name when we are writing about you in our research. This is so people involved in the research and people who read our research can't identify you.)

Photo number _____

This is a picture of _____
_____
_____

I took this photo because _____
_____
_____
_____

When I was taking this photo I felt _____
_____
_____
_____

This photo makes me think about _____
_____
_____
_____

Extra information about this photo for the researchers:
_____
_____
_____
_____

Photo number _____

This is a picture of _____
_____
_____

I took this photo because _____
_____
_____
_____

When I was taking this photo I felt _____
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This photo makes me think about _____
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_____

Extra information about this photo for the researchers:
_____
_____
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_____

Appendix 2.2: Photography Task Instructions

Supporting Students with Autism Spectrum Disorder in Higher Education

Instruction Sheet - Photography Study

This package contains:

- A digital camera (on loan)
- A diary booklet
- An information sheet (for you to keep)
- Two copies of the consent form (one for you to keep)
- A stamped addressed envelope

This is what you need to do:

1. Sign one copy of the enclosed consent form.
   (You do not need to do this if you have already returned one by email).

2. Take photographs around your campus using the digital camera provided.
   We have included some tips to help you on the next page.

3. Write about each photograph in the photo diary booklet provided.
   You can do this as you take each photograph, or you can do it when you review the photographs on the camera at the end of the day.

4. When you have finished, put the camera and the photo diary booklet and the signed consent form in the envelope that we sent you, and post it.
   (The envelope has our address and the right amount of stamps so you can put it straight in a post box.)

After you have finished this task and we have received your envelope we will contact you on your university email address to arrange a time for you to meet with one of the researchers to talk about your photographs and what it is like for you to be a student at the university.

Tips to help you with the photography task

Take photos around your campus of anything that is important to you about your experience at the university. We are particularly interested in pictures that explain what you find helpful or not helpful.

What should I take photos of?

Photos can include:

a. Pictures of places that you go to regularly, or of places that you avoid.
   (This could be pictures of outdoor spaces, buildings, the interior of rooms or features or qualities that you find calming or stressful – for example colours, sounds and temperature.)
b. Pictures of things that you find helpful or unhelpful in accessing information and making sense of it for your studies.
   (This could be pictures of written study materials, websites, computers and iPads, or of support materials developed specifically for you by your family, disability services or other people.)
c. Pictures of social situations where you interact with other people.
   (These could be situations that you enjoy or that you find difficult.)

It is OK to take pictures of places with people in the background, but if you want to take a picture of a particular person you should ask them if this is OK.
If they say 'no', don't take the picture, but you can write about what picture you wanted to take in the photo diary booklet.

It is OK to ask a friend or mentor to help you decide what photos to take.

How many photos should I take?

You don't have to take a particular number of photos.
You should take as many photos as you need to explain the things that are important to you, and things that you would like the researchers to know about.
As a guide you might take between 10 to 30 photos.

When should I take the photos?

Pick a time that suits you.
You could take photos over one typical day at your university campus. Try and pick a day where you go to a variety of different places and interact with different people.
Alternatively you could take photos over a number of days.

What should I write in the photo diary booklet?

There are instructions on the front of the photo diary booklet.
You can write whatever you want about each photo.
You don't have to complete all the pages of the booklet.

We would like you to complete the photography task within two weeks.