UNIVERSITY AS ENABLER FOR INCLUSION: THE CERAMICIST, THE TUTOR, THE STUDENT AND THE AUTISTIC ADULT

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ABSTRACT

Inclusion of people with disabilities, or 'different' abilities, is recognised as a major societal issue, in this instance, autistic people. This pedagogic small-scale investigation rethinks the university educator to student relationship, through an experiential brief, to design a ceramics college for autism. A collaborative, human-centred, case study perspective, encompasses not only an interior architecture student, a tutor with a ceramics research interest and a tutor with a research interest in autism, but also opens up dialogue with a professional ceramic artist and an autistic young person; the latter three, living in the same community. Intrinsically, it offers a cross-disciplinary approach utilising participatory-based learning within an inspiring, fully operational, workshop setting. Opportunities to hear the autistic voice, exploring sensory and behavioural needs first-hand, avoid pre-conceived internal dialogues and artificial objectives, encouraging exploration beyond purely the aesthetic.

The paper describes the process of setting up and running a live 'sensorium' ceramics workshop, expanding effective learning beyond the design studio, teaching a complex subject area, wherein no two people are affected by autism identically. It explores how to discern the optimum learning environment and how sensory considerations, primarily offering choice, assist. Inherently, many design strategies developed for autistic people may also be of benefit for neuro-typical people, in different educational settings.

In essence, the research creates and advocates the innovative 'ASD-Uni-Outreach' micro-teaching model as being sustainable and viable for piloting in alternative university courses, with community subject expertise. This good practice model maximises social interaction, provides a deeper level of autism understanding for the design student, and augments skills for autistic young people. The paper champions that unconventional users require unconventional approaches to knowledge gathering. The design of autism colleges is advanced through providing budding professionals with an insight into designing responsive spatial environments.

INTRODUCTION

Plentiful research concerns changing individuals' perceptions to stimuli rather than adapting environments,[1] and neuro-typical end-user engagement in design processes.[2] However, as every autistic person experiences environment differently,[3] rigorous evidence-based environmental studies in this field are rare. Sourcing control samples is challenging,[4] and potentially misleading, as some autistic people switch rapidly from hypo-sensitivity to hyper-sensitivity.[5] Individual sensory preferences are the subject of a growing body of knowledge. [6,7,8,9]

Viewing a person for their capabilities rather than autism is advocated,[10] listening and empowering community participation through education and work.[11,12] However, following structured school education, limited choices exist,[13] particularly for those sufficiently able for employment but without formal qualifications.

AIMS

In an age of Pinterest and fast images, students can misinterpret why designers design, meaning educators must ensure a richer learning experience conveying awareness that they are designing spaces for real users with real issues.[14]

Encompassed is not only an innovative approach to knowledge acquisition about 'autism-friendly architecture,'[15] but also creativity in sharing this knowledge. Extending beyond traditional student case studies and functional investigation of existing spaces, incorporation of behavioural aspect of users, to 'illuminate a case from different angles,'[16] is here exemplified through live ceramics workshops.

The teaching model described offers alternative inclusion means with ambition to create local contacts, improve communication, raise self-esteem and confidence, and supplement skills for autistic young people. This can smooth the path into work-experience, employment, or simply provide what can be a much-needed added interest with structure and familiarity.

METHODOLOGY UTILISING A TEACHING MODEL: 'ASD-UNI-OUTREACH, MICRO-MODEL'

Previous research,[17] concluded that, although informative, a child-centred project with an autism school is an unsustainable university teaching model. This directed the author to simplify the model, focussing on working with an individual autistic adult.

Live community-based activity is combined with studio pedagogy, encompassing craft as a sensory, therapeutic learning activity,[18,19] in parallel to empirical case study methodology. The tutor, as facilitator, enables the student to undertake primary research observing human behaviour, to inform and inspire spatial design. Everyday environments can affect autistic people and sensory processing disorders through both positive or anxious behaviours.[20] The simultaneous gathering of information, direct from user and ceramicist, helps create holistic understanding, a community of practice.[21]

Two-way collaboration between university and community is an established approach;[22] however, this 'ASD Co-Micro Model' adopts a three-way approach including an autistic 21-year-old young person (YP).

PRE-WORKSHOP STAGES

Early Investigations

- Establish autism inspired student project brief founded on tutor and local professional expertise.
- Contact local National Autistic Society to locate YP with skills match and interest in joining project.
- Check viability or 'fit', obtaining permission to speak to family or carers concerning sensory or behavioural issues, gauging level of sensory environment[23] tolerated.
- Attain research ethics compliance and informed consent.

Recording an Intimate History

A two-pronged approach is adopted: an advance interview between tutor, student and YP's mother, who provides insightful background observations, followed by gathering information direct from YP at a live workshop session.

Understanding the User's Heightened Sensory Perceptions and Developmental and Behavioural Issues, through Parent Interview

Examples of factors:

- Transitioning and Tactile sensitivities: YP prefers several layers of soft clothes even inside, disliking aprons.
- Although fluent verbally, assimilating information challenges YP so tasks are prepared accordingly, using examples, repetition, reinforcement.
- YP is future focussed with anxiety, so regular clear instructions are provided with choice over breaks and timing.
- YP can present as having greater ability than actuality and will tell you what she thinks you want to hear - managed by careful questioning plus testing and clarifying responses.
- YP will cope with maximum of four adults in the space.
- Mother decides to be absent, otherwise YP will look to her for validation.

Specific Issues Raised at Interview which Relate to the Organisation of Interior Space

Proprioceptive difficulties:

- YP likes to stomp feet for stimulus,[24] so floor area kept clear.
- Issues with proximity - an 'arm's-length rule' to judge personal space.[25]
- YP is a little clumsy, so breakable items are removed.
- Avoid the touch of water on skin.
- Sound sensitivities: YP cannot cope well with certain background sounds; windows and doors are shut.
- Light and Smell sensitivities: YP has no known issues with natural or artificial light or smells.

Discourse Surrounding User's Needs to Inform Spaces

Tutors, ceramicist and student discuss and debate what skills, for both activity and employment, YP will gain from the workshop. This effectively communicates the link between user's needs and activities to inform spatial configuration.

- *Communication and social skills. Issue:* listening and speaking to four unfamiliar adults whilst concentrating on a task. *Response:* all professionals engage in the clay making workshop as 'students,' then YP becomes just another member of the session.
- *Turn taking skills. Issue:* too many interruptions. *Response:* look for behavioural clues and offer fewer interruptions or time out.
- *Working with the unexpected/flexibility of thought.* All members of the workshop bring 'found objects' of choice to press into clay. Ceramicist provides an extensive library of objects, so YP can be given choice, a known and/or unexpected object.
- *Gross Motor Skills. Activity:* Digging out clay with hands and rolling. *Issue:* tactile sensitivity. *Response:* small pre-rolled clay balls available.
- *Fine Motor Skills. Activity:* Cutting and decorating. *Issue:* tactile sensitivity. *Response:* choice of tools, which can reduce resistance to touching clay,[26] or making by hand to encourage de-sensitization.

Advance Preparation for Ceramics Workshop Activities

Information is gathered about YP to gain prior knowledge on how to engage and structure the workshop, 'capitalising on autistic strengths:'[27]

- *The known:* existing interest in art is established.
- *The specific:* detailed information about other special interests i.e. drawing, mono-printing and horse riding.
- *The tailor-made:* aspects of pertinent interests are defined and integrated into clay-based activities.
- *The tasks:* sketching[28] and making pitchfork marks into clay, form part of the new activity.

Clear Job Roles with Three Supporting Tutors and One Student

- Ceramicist concentrates on actual activity with YP. She then hands over to design student after each stage is set up, creating a symbiotic relationship with YP, allowing time for 'mutual understanding and a process of translation.'[29]
- One tutor interjects with questions and suggestions. Photographs are taken throughout to record the process for the student and tutor to interpret later.
- Another tutor takes an overview of the workshop, especially YP's anxiety levels and timetable. For accuracy and later interpretation, a film recording is made.

Figure 1. Intensive Interaction between student and YP; mobile phone - a mini 'time out;' task lighting from behind; student recording the activity. Photographs by Author.

THE 'SENSORIUM'[30] WORKSHOP PLAN

A common activity is defined: the ceramics workshop as a means of 1:1 hands-on, two-way learning, between student and YP, to understand some of the spatial and sensory requirements for the student project. The workshop is not meant to be a sensory assessment, but the gathering of fundamental observations.

'The Production Line' Approach to The Interior

To focus attention, a predictable, structured[31] linear sequence of activities is set up, incorporating 'offshoots' for creative play or 'time out' to recalibrate. Gradually, the ability to follow a complete sequence can be developed. Alternatively, a YP who struggles to break out of a linear arrangement[32] might learn how to accept change by targeting pertinent activities throughout the process.

1. *Arrival and assimilation of spaces.* The YP is nervous when entering the first, domestically scaled room, with new people. Therefore, introductions are brief, and the ceramicist quickly shows her ceramic gallery, before moving into the informal small workshop.
2. *Ice-breaker.* Utilising intensive interaction,[33] YP is asked to mould and squeeze clay, the ceramicist copying and engaging YP by talking briefly about the next activity and opening up conversation.
3. *Introduction.* To contextualise, on a computer in an under-stair alcove, the ceramicist shows a series of digital images of the site where she has accessed fresh clay. YP keeps her distance,

including after invitations to move closer, being still quite nervous with proximity issues.

4. *Time Out in an adjacent room.* YP chooses to go on her phone for 5 minutes, providing an opportunity to process information.[34]

Figure 2. Computer recess; view towards 'time out' space; selected worktop. Photographs by Author.

Real-time Environment Choices to Inform The Interior

YP is given two clear choices for each option, whilst undertaking the main activity. Examples include:

- 'Seated' or 'standing?'
- Worktop 'facing the window' or 'away from the window?'
- Blind 'up', or 'down?'
- Mirror on adjacent wall 'left' or 'covered up?'
- Directional angle-poise light 'on' or 'off?'

Following establishing an optimum learning environment,[35] activity commences.

Activity 1: Demystifying Clay Processing

YP is given the opportunity to explore sensory qualities of materials in four bowls:[36] pure clay; slip; murky water with some clay; water.

Responses to different consistencies of clay: YP easily touches an unprocessed clay ball and likes its texture. When offered unprocessed rough clay containing some water, YP holds out her finger but does not want to touch, saying '*I'm alright.'*

However, when offered smooth and silky processed clay, YP appreciates its malleability. This acts as an effective ice-breaker. At this point, YP starts to relax and enjoy the activity.

YP becomes completely focussed when processing clay. The ceramicist stands side-by-side with YP, to demonstrate or offer choices such as:

- *YP or ceramicist to scoop the unprocessed liquid clay?*
- *Scrape the clay across the plaster bat 'with the rubber kidney', or 'bare hands?'*

YP comments include: *'As long as you keep me busy that is fine;' 'I like this a lot;' 'This is so cool, it is good to get stuck in. I think everyone wants to work with me now. I am ahead of you guys.'* YP becomes very confident when successful and seeing the immediate transformation of clay by her own hands.

Activity 2: Pinch Pot Making

YP readily starts to make a pinch pot with soft yet firm clay (demonstrated first). Proprioceptive difficulties are observed with too much force being exerted on the clay; YP recognises pressure needs reducing. YP chooses to sit down on a stool (after 55 minutes standing).

Linking activity: A repetition of the previous task, making a pinch pot, using a more subtle, finer white clay. YP recalls and repeats the process commenting *'I get ocd with things like this, I'm liking it.'* Moving forward, no preference is shown for either clay type.

Figure 3. Confidence grows as different touching experiences become familiar. Photographs by Author.

Activity 3: Mark Making with Objects

Options continue to be offered, such as:

- Rolling out white clay with *'hands'* or *'rolling pin?'*
- *'Soft'* or *'hard'* objects to press into the clay?

The Random. The ceramicist suggests pressing clay into the adjacent exposed brick wall, providing YP with the opportunity to look at her environment differently. Individual alphabet letters are pressed into the clay to spell her name, which she repeats and comments *'I want to keep these in my room, if that's alright*.'

Time Out. YP becomes more anxious, checking her phone frequently. The choice of a break and drink is provided. YP then decides that she would like to treat the group to biscuits from the nearby supermarket. Without warning, YP leaves. Although YP is independent enough to do this herself, for safety the tutor accompanies her.

Figure 4. Proprioceptive opportunities with the clay; pulling the cheese cutter; spreading with a rubber kidney; rolling pin; pushing through a sieve; pressing into a brick texture on the wall. Photographs by Author.

Activity 4: Drawing with Tools

A selection of four tools are explored in turn. YP shows a steady hand when sketching in clay, developed from her pre-established drawing skills.

Activity 5: 3D Experimental Pieces

The plasticity of clay allows a butterfly to be reshaped into a hedgehog; YP draws a spiral and then is prompted to make a rose, saying '*I'm shaking I'm really impressed with that…this is so beautiful.'* After a further hour, she announces *'I've got to go now.*'

Observations of making. YP enjoys creating the rose, more than the textures, as making the leaves of the rose is instantaneous, yet forms something recognisable, an end product.[37] When provided with the choice of a tool rather than bare hands, the tool is always the preferred option. In answering whether working with the clay makes her feel calm, YP shares '*When I'm depressed, I might come here,'* clearly communicating the session's positive effect.

Figure 5. Fine Motor Skills and Concentration: experimenting with pressing in different textures; sketching; making a rose. Photographs by Author.

RE-READING THE WORKSHOP: INSIGHTS AND INTERPRETATIONS

Reflective discourse between student and tutors, of written notes, sensory and behavioural observations, photographs and film recording, discloses that working closely with autistic people[38], can reveal clues and problems to establish 'design parameters:'[39]

Parameters for the 'Design a Ceramics College' Project

Spatial parameters:

- Provide external activity spaces for vestibular and socialisation opportunities, possibly through the digging up of the clay from small adjacent pits.
- Allow time and space to process information between activities.[40]
- Adopt the 'one arm rule,' supporting proprioceptive difficulties.
- Provide both formally and informally configured spaces, each being spontaneously accessible from the other.
- Allow for options, anticipating unpredictable sensory preferences, with practical activities preferable over theory, ensuring the design of spaces reflects this flexibility and the potential to extend activities.
- Provide clarity of purpose for each space, avoiding user confusion.
- A degree of control is required to keep the YP on task. This could be supported by a sequence of spaces[41] and visual support, which reflects the process of working with clay.
- High levels of interaction with supporting adults[42] is demanding and so 'Time out' spaces should be accessible.
- Consider natural adjustable lighting preferably using northern light avoiding high contrast shadowing. Consider artificial lighting which can be separately switched and moveable task lighting.
- Security of spaces, encouraging a level of safe independence.

- Acoustics.[43, 44]
- Isolate different activity spaces avoiding bleeding of sound, light, movement and smell.

Furniture parameters:

- Provide flexible seating options.
- Allow for stools to be accessible but also moved away when not required. Low seating options give YP the opportunity to observe the process from a quiet space.
- Allow choice of worktop location and height, accounting for office environment ergonomics.[45]
- Clear worktops frequently to avoid 'too much information'[46] or sensory overload, and to give focus. Consider adjacent spaces to allow quick storage of objects, and two sliding worktops so a clear worktop is constantly available.
- Mirrors can bring light into a dark space but can also distract so may need to be covered. They also allow indirect observation by the tutor without staring at the YP.
- Allow for adjacent sink for handwashing with options on water pressure e.g. a soft rainwater spray and a standard flow.
- Consider how to integrate visual support, e.g. PECS timetable, without interfering with the clay making process.

Materiality parameters:

- Consider window treatments to limit distraction of views or a screen as a diffuser.
- Consider flooring treatments which provide a little 'give' or resistance e.g. rubber, to aid in proprioceptive difficulties.

QUALITATIVE ANALYSIS OF THE EXPLORATORY MODEL

Being immersed in the experience[47] first-hand, knowledge assimilation by the student directly triggers design problems to be considered. This accessible approach paves the way for students to reduce the gap between 'skills, self-perception and expectation.'[48]

A visual timetable of the workshop activities may have been supportive[49] as the YP is anxious about time and leaves unexpectedly for a previously unannounced but pre-arranged meeting with a friend.

Once the optimum personal learning environment is achieved, within the constraints of a non-autism specific environment, the YP becomes so focussed on the calming, repetitive, clay activities for the first 2 hours, that her immediate surroundings appear not to distract her significantly. The interpretation of a dialogue with space, people and action to find a truth is tested; however, an absolute conclusion on the impact of each sensory aspect of the space on her learning, is difficult to define fully.

Feedback from YP and Student

At a later meet up in the university, YP enjoys seeing her fired ceramic pieces and the transition which occurs from wet to dry clay.

The student, after she graduated and entered the design profession, gives feedback that she gained awareness that designing for sensory sensitivities for those who are autistic is an approach which can be used to inform all design projects.

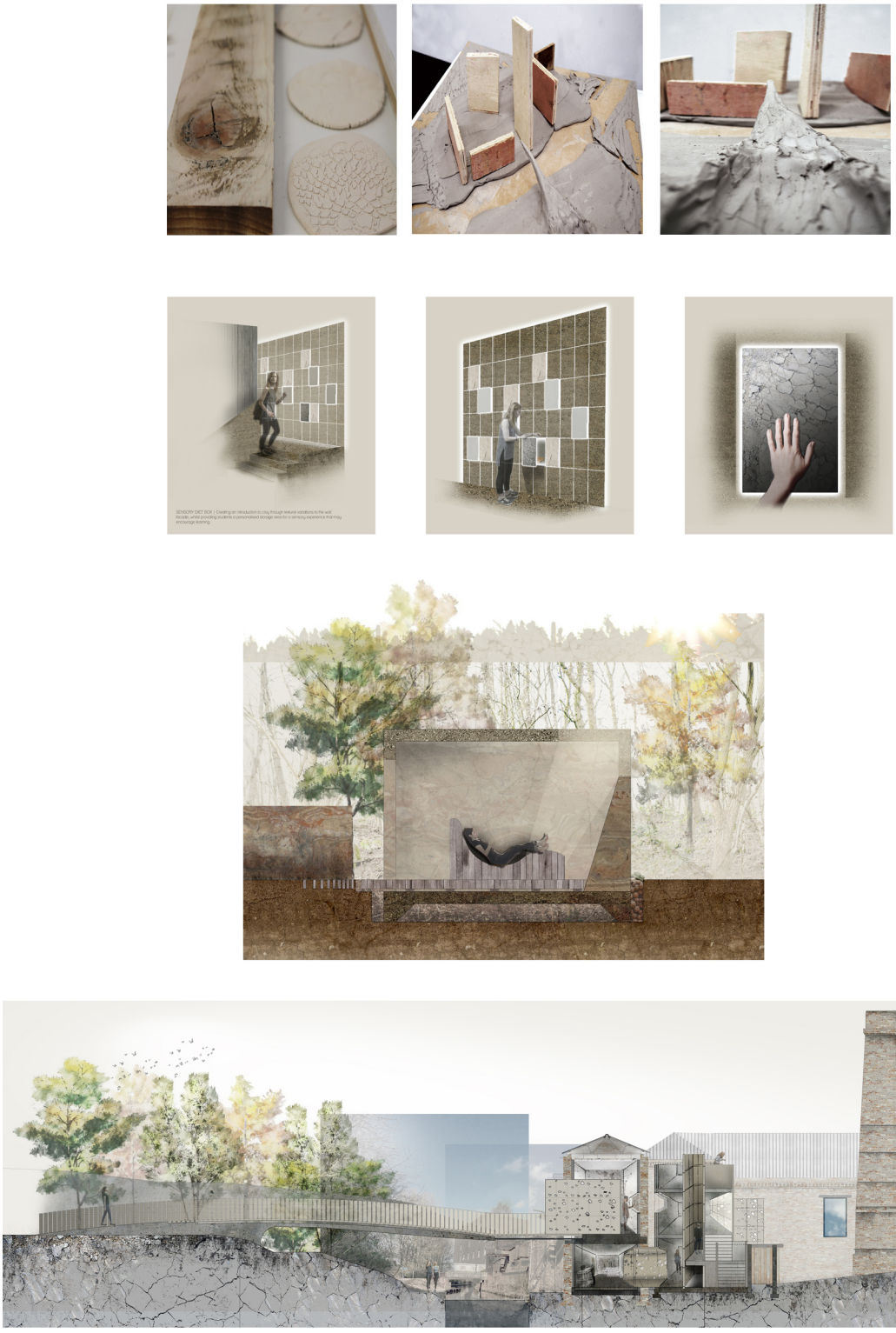

Figure 6. A Ceramics College for Autism, informed by The Sensorium Workshop: ceramic experiments; sensory diet boxes; calm space; transitioning bridge from clay pit. Images by student.

CONCLUSION

Applied learning from the sensorium workshop provides the student with an empathy,[50] an opportunity 'to see the world through the eyes of autism,'[51] in parallel to exposure to 'a balanced awareness of the constraints and complexities of design,'[52] to inform and augment the student's design knowledge (fig. 6). The 'dynamic and contested field' of design[53] can flourish via universities without walls.

Close social interaction[54] with the autistic YP, the ceramicist and two tutors as 'facilitators,'[55] provides the student with a validity, the freedom to reshape the brief based on their developing knowledge.[56] Student design process becomes more purposeful and responsive to unique characteristics[57] of the user, additionally benefitting from an insight into practical requirements of a ceramic workshop.

The experiential[58] workshop illustrates that an ability to be highly focused over a new engaging task, can enable this YP to excel in an unfamiliar setting, if modified carefully. 'The physical environment generates opportunities for action.'[59] Redirecting pre-developed skills, i.e. drawing, in an alternative way, can be motivating, leading to success which can 'be extended out into the community.'[60] All principles lend themselves to replication in similar workshops (e.g. painting, printing, felt making, woodwork) and on other educational courses such as art, textiles and product design.

A further benefit would be if the YP could be an apprentice to the ceramicist for future workshops. Alongside learning the all-important craft-based making skills, such sessions could also foster tangible competencies in communication, social interactions, time management and turn-taking instructions. This opportunity would be a more sustainable outcome than the short-term work experience sessions which the YP undertook at the local vets and supermarket, which concluded in no permanent employment.[61]

Universities could be part of the solution for inclusion, 'voices should not have to be loud to be heard,'[62] whilst helping to create enduring knowledge for future designers surrounding 'autism-friendly architecture.'[63] Since the needs of those on the spectrum vary widely, the clear message paving the way, of providing a distinct 'choice'[64] of activity and 'flexibility' of environment for autistic people, is propitious.

References

1. Katie Gaudion, "A Designer's Approach: Exploring how Autistic Adults with Additional Learning Disabilities Experience their Home Environment." (PhD diss., Royal College of Art, 2015). http://researchonline.rca.ac.uk/id/eprint/1692 , 474.

2. Joan Greenbaum, "A Design of One's Own: Towards Participatory Design in the US." *DAIMI Report Series* 20, no.375 (1991):1, accessed January 8, 2020. doi: 10.7146/dpb.v20i375.6607.

3. Phoebe Caldwell, and Jane Horwood, *Using Intensive Interaction and Sensory Integration: A Handbook for Those who Support People with Severe Autistic Spectrum Disorder. (*London: Jessica Kingsley Publishers, 2008), 38.

4. Julie E.N. Irish, "Evidence-based design: Documenting a research experiment in a school environment with children with autism spectrum disorder." *Archnet-IJAR: International Journal of Architectural Research* 13, no 1 (2019): 26, accessed January 8, 2020. doi:10.1108/ARCH-12-2018-0029.

5. Olga Bogdashina, *Sensory Perceptual Issues in Autism and Asperger Syndrome: Different Sensory Experiences – Different Perceptual Worlds.* (London: Jessica Kingsley Publishers, 2003), 53.

6. Iain Scott, "Designing Learning Spaces for Children on the Autism Spectrum." *Good Autism Practice 10*, no.1, (2009): 36, accessed January 8, 2020. doi: 10.1080/14606925.2017.1352738.

7. Temple Grandin, *The Way I See It*. (Texas: Future Horizons, 2011).

8. Andrew Brand and Katie Gaudion, *Exploring Sensory Preference; Living environments for adults with autism.* (London: Helen Hamlyn Centre for Design, Royal College of Art, 2012).

9. Joan Scott Love, "Sensory Spaces: Sensory Learning – An Experimental Approach to Educating Future Designers to Design Autism Schools." *Archnet-IJAR: International Journal of Architectural Research* 12, no. 3, (2018): 160, accessed January 8, 2020. doi: 10.26687/archnet-ijar.v12i3.1704.

10. National Autistic Society. "Consultation on Improving Lives." London, February 2017.

11. “World report on disability.” World Health Organization and World Bank, accessed January 8, 2020, https://www.who.int/disabilities/world_report/2011/report.pdf

12. “New Urban Agenda, Resolution adopted by the General Assembly on 23 December 2016, Seventy-first session, Agenda item 20.” UN General Assembly, accessed January 8, 2020. https://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_RES_71_256.pdf

13. Julie L. Taylor and Marsha M. Seltzer, M. “Employment and Post-Secondary Educational Activities for Young Adults with Autism Spectrum Disorders During the Transition to Adulthood.” *Journal of Autism and Developmental Disorders 41*, (2011): 566, accessed January 8, 2020. doi: 10.1007/s10803-010-1070-3.

14. Helena Webster, “Architectural Education after Schön: Cracks, Blurs, Boundaries and Beyond.” *Journal for Education in the Built Environment 3*, no. 2 (2008): 73. Accessed January 8, 2020. doi: 10.11120/jebe.2008.03020063.

15. Joan Scott Love, “How Autism-Friendly Architecture Can Change Autistic Children’s Lives.” *The Conversation*, 31 July, 2019. Accessed January 8, 2020. https://theconversation.com/how-autism-friendly-architecture-can-change-autistic-childrens-lives-120516

16. Rolf Johansson, “A Case Study Methodology” (paper presented at the conference for Methodologies in Housing Research, Stockholm, Sweden, September 22–24, 2003).

17. Love, Sensory Spaces, 166.

18. Elissa A. Parkerson, *Art for Autism: Enhancing the Lives of Children.* USA: CreateSpace, 2010). 13.

19. Lynne Souter-Anderson, *Making Meaning: Clay Therapy with Children and Adolescents.* (Buckingham: Hinton House publishers, 2015). 3.

20. Katie Gaudion, *Designing Everyday Activities: Living Environments for Adults with Autism. (*London: Helen Hamlyn Centre for Design, Royal College of Art, 2013), 26.

21. Étienne Wenger, *Communities of Practice: Learning, meaning, and identity.* (Cambridge: Cambridge University Press, 1998). 122.

22. Rachel Sara, and Matthew Jones. “The University as Agent of Change in the City: Co-creation of Live Community Architecture.” *Archnet-IJAR: International Journal of Architectural Research 12,* no.1, (2018): 326, accessed January 8, 2020. doi: 10.26687/archnet-ijar.v12i1.1286.

23. “Creating an autism friendly and safe space.” National Autistic Society, accessed January 8, 2020. https://www.autism.org.uk/about/family-life/in-the-home/environment.aspx .

24. Caldwell, *Using Intensive Interaction,* 87.

25. “Sensory Differences.” National Autistic Society, accessed January 8, 2020. https://www.autism.org.uk/about/behaviour/sensory-world.aspx .

26. Parkerson, *Art for Autism, 13.*

27. Marc Fabri and Debra Satterfield. “Special Issue on Designing With and For Users on the Autism Spectrum.” *International Journal of Human-Computer Interaction 35,* no.8 (2019): 641, accessed January 8, 2020. doi:10.1080/10447318.2018.1550181.F.

28. Anna Whitehouse, *Sketching in Clay.* (UK: Anna Whitehouse, 2019).

29. Peter Vermeulen, *Autistic Thinking – This is the title.* (London: Jessica Kingsley Publishers Ltd, 2001). 9.

30. Michel Serres, *The Five Senses: A Philosophy of Mingled Bodies.* (London: Bloomsbury, 2008).

31. Patricia Howlin, *Autism and Asperger syndrome: Preparing for adulthood.* (London: Routledge, 2004).

32. Vermeulen, *Autistic Thinking,* 91.

33. Caldwell, *Using Intensive Interaction,* 1.

34. Donna Williams, *Autism: An Inside-Out Approach.* (London: Jessica Kingsley, 1996). 116.

35. Love, Sensory Spaces, 160.

36. Zuzana Ťulák Krčmáriková and Ivana Lessner-Listiakova, “Sensory aspects of art therapy work with clay” (paper presented at the 5th SGEM International Multidisciplinary Scientific Conferences on Social Sciences and Arts, Varna, Bulgaria, August 26 – September 1, 2018).

37. Julia Moor, *Playing, Laughing and Learning with Children on the Autism Spectrum.* (London: Jessica Kingsley Publishers Ltd., 2002). 199.

38. Michael Eraut, *Developing Professional Knowledge and Competence.* (London: Routledge,1994), 14.

39. Rachna Khare and Abir Mullick, “Incorporating the Behavioural Dimension in Designing Inclusive Learning Environment for Autism.” *Archnet-IJAR: International Journal of Architectural Research 3,* no. 3 (2009): 46, accessed January 8, 2020. doi: 10.26687/archnet-ijar.v3i3.189.

40. Joan Scott Love, "Studio teaching experiments – spatial transitioning for autism schools", *Archnet-IJAR: International Journal of Architectural Research 13*, no. 1, (2019): 53, accessed January 8, 2020. doi.10.1108/ARCH-11-2018-0019.

41. Magda Mostafa, “Designing for autism: an ASPECTSS™ post-occupancy evaluation of learning environments.” *Archnet-IJAR: International Journal of Architectural Research 12,* no. 3, (2018): 316, accessed January 8, 2020. doi: 10.26687/archnet-ijar.v12i3.1589.

42. Moor, *Playing, Laughing and Learning,* 199.

42. Mostafa, *Designing for autism*, 314.

43. Shireen Kanakri, “Spaces Matters: Classroom Acoustics and Repetitive Behaviors in Preschool Children with Autism.” *American Journal of Pediatrics* 3, no. 6 (2017): 89, accessed January 8, 2020. doi: 10.11648/j.ajp.20170306.15.

45. “HSG57 - Seating at work: Health and Safety Executive.” HM Government, accessed January 8, 2020. https://www.hse.gov.uk/pUbns/priced/hsg57.pdf

46. Bogdashina: *Sensory Perceptual,* 53.

47. Stefani Ledewitz, “Models of Design in Studio Teaching.” *Journal of Architectural Education 38*, no. 2 (1985): 2, accessed January 8, 2020. doi: 10.1080/10464883.1985.10758354.

48. Kamila Kunrath, Philip Cash, and Jason Li-Ying, “’Designers’ identity’: skills' self-perception and expectation in design students. Human behaviour and design” (paper presented at the 15th International Design Conference, Dubrovnik, Croatia, May 21-24, 2018).

49. Moor, *Playing, Laughing and Learning,* 256.

50. Katie Gaudion, Ashley Hall, Jeremy Myerson, and Liz Pellicano, “’Design and wellbeing’: Bridging the empathy gap between neurotypical designers and autistic adults” (paper presented at the conference for the Design for Sustainable Well-being and Empowerment, Bangalore, India, June 12-14, 2014).

51. Vermeulen, *Autistic Thinking,* 9.

52. Ashraf M. Salama, *Spatial Design Education: New Directions for Pedagogy in Architecture and Beyond.* (London: Routledge, 2015). 220.

53. Webster, *Architectural Education*, 68.

54. Karine Dupre and Adriana P. Higashino. “Australia-Japan Tearoom Design Workshop: Questioning the Validity and Effectiveness of International Partnerships and Summer Schools.” *Charrette* 5, no. 1 (Spring 2018): 78, accessed January 8, 2020. https://www.ingentaconnect.com/content/arched/char/2018/00000005/00000001/art00007

55. Helena Webster, “Facilitating reflective learning: Excavating the role of the design tutor.” *Journal of Art, Design and Communication in Higher Education 2*, no. 3 (2004): 101, accessed January 8, 2020. doi: 10.1386/adch.2.3.101/0.

56. Rosangela Tenorio, Monto Mami, and Rainer Hirth. “India Workshop: Partnering for a Socially Active Design Approach.” *Charrette 5*, no.1 (Spring 2018): 111, accessed January 8, 2020.

57. Ashraf M. Salama, "Prospects for research in architecture and urbanism." *Archnet-IJAR: International Journal of Architectural Research 13,* no.1, (2019): 3, accessed January 8, 2020. doi: 10.1108/ARCH-02-2019-0029.
58. David A. Kolb, *Experiential Learning: Experience as the source of Learning and Development.* (Englewood Cliffs: Prentice Hall, 1984).

59. James J. Gibson, *The Ecological Approach to Visual Perception.* (New Jersey: Lawrence Erlbaum Associates Ltd, 1979).

60. Gaudion, *Designing Everyday Activities,* 27.

61. "The Autism Employment Gap." National Autistic Society, accessed January 8, 2020. file:///C:/Users/Joan/Downloads/TMI%20Employment%20Report%2024pp%20WEB.pdf

62. Kate Wall, Claire Cassidy, Mhairi. Beaton, Lorna Arnott, Carol Robinson and Elaine Hall, "'Look who's talking': Dilemmas of practice when eliciting the voices of young children" (paper presented at the American Education Research Association Conference, Toronto, Canada, April 5-9, 2019).

63. Love, *How Autism-Friendly Architecture.*

64. Love, *Studio teaching experiments*, 54.

Bibliography

Bogdashina, Olga. *Sensory Perceptual Issues in Autism and Asperger Syndrome: Different Sensory Experiences – Different Perceptual Worlds.* London: Jessica Kingsley Publishers, 2003.

Brand, Andrew, and Katie Gaudion. *Exploring Sensory Preference; Living environments for adults with autism.* London: Helen Hamlyn Centre for Design, Royal College of Art, 2012.

Caldwell, Phoebe, and Jane Horwood. *Using Intensive Interaction and Sensory Integration: A Handbook for Those who Support People with Severe Autistic Spectrum Disorder.* London: Jessica Kingsley Publishers, 2008.

Dupre, Karine, and Adriana P. Higashino. "Australia-Japan Tearoom Design Workshop: Questioning the Validity and Effectiveness of International Partnerships and Summer Schools." *Charrette* 5, no. 1 (Spring 2018): 78-89. Accessed January 8, 2020. https://www.ingentaconnect.com/content/arched/char/2018/00000005/00000001/art00007

Fabri, Marc, and Debra Satterfield. "Special Issue on Designing With and For Users on the Autism Spectrum." *International Journal of Human-Computer Interaction 35,* no.8 (2019): 641-642. Accessed January 8, 2020. doi:10.1080/10447318.2018.1550181.F.

Eraut, Michael. *Developing Professional Knowledge and Competence.* London: Routledge,1994.

Gaudion, Katie. *Designing Everyday Activities: Living Environments for Adults with Autism.* London: Helen Hamlyn Centre for Design, Royal College of Art, 2013.

Gaudion, Katie. "A Designer's Approach: Exploring how Autistic Adults with Additional Learning Disabilities Experience their Home Environment." PhD diss., Royal College of Art, 2015. http://researchonline.rca.ac.uk/id/eprint/1692

Gaudion, Katie, Ashley Hall, Jeremy Myerson, and Liz Pellicano. "'Design and wellbeing': Bridging the empathy gap between neurotypical designers and autistic adults." Paper presented at the conference for the Design for Sustainable Well-being and Empowerment, Bangalore, India, June 12-14, 2014.

Gibson, James, J. *The Ecological Approach to Visual Perception.* New Jersey: Lawrence Erlbaum Associates Ltd, 1979.

Grandin, Temple. *The Way I See It*. Texas: Future Horizons, 2011.

Greenbaum, Joan. "A Design of One's Own: Towards Participatory Design in the US." *DAIMI Report Series* 20, no.375 (1991):1-14. Accessed January 8, 2020. doi: 10.7146/dpb.v20i375.6607.

HM Government. "HSG57 - Seating at work: Health and Safety Executive." Accessed January 8, 2020. https://www.hse.gov.uk/pUbns/priced/hsg57.pdf

Howlin, Patricia. *Autism and Asperger syndrome: Preparing for adulthood.* London: Routledge, 2004.

Irish, Julie. E.N. "Evidence-based design: Documenting a research experiment in a school environment with children with autism spectrum disorder." *Archnet-IJAR: International Journal of Architectural Research* 13, no 1 (2019): 25-38. Accessed January 8, 2020. doi: 10.1108/ARCH-12-2018-0029.

Johansson, Rolf. “A Case Study Methodology.” Paper presented at the conference for Methodologies in Housing Research, Stockholm, Sweden, September 22–24, 2003.

Kanakri. Shireen. “Spaces Matters: Classroom Acoustics and Repetitive Behaviors in Preschool Children with Autism.” *American Journal of Pediatrics* 3, no. 6 (2017): 89-94. Accessed January 8, 2020. doi: 10.11648/j.ajp.20170306.15.

Khare, Rachna, and Abir Mullick. “Incorporating the Behavioural Dimension in Designing Inclusive Learning Environment for Autism.” *Archnet-IJAR: International Journal of Architectural Research 3,* no. 3 (2009): 45-64. Accessed January 8, 2020. doi: 10.26687/archnet-ijar.v3i3.189.

Kolb, David, A. *Experiential Learning: Experience as the source of Learning and Development.* Englewood Cliffs: Prentice Hall, 1984.

Kunrath, Kamila, Philip Cash, and Jason Li-Ying. “ ‘Designers’ identity’: skills' self-perception and expectation in design students. Human behaviour and design.” Paper presented at the 15th International Design Conference, Dubrovnik, Croatia, May 21-24, 2018.

Ledewitz, Stefani. “Models of Design in Studio Teaching.” *Journal of Architectural Education 38*, no. 2 (1985): Accessed January 8, 2020. doi: 10.1080/10464883.1985.10758354.

Love, Joan Scott. “Sensory Spaces: Sensory Learning – An Experimental Approach to Educating Future Designers to Design Autism Schools.” *Archnet-IJAR: International Journal of Architectural Research 12*, no. 3, (2018): 152-169, accessed January 8, 2020. doi: 10.26687/archnet-ijar.v12i3.1704.

Love, Joan Scott. "Studio teaching experiments – spatial transitioning for autism schools", *Archnet-IJAR: International Journal of Architectural Research 13*, no. 1, (2019): 39-57, accessed January 8, 2020. doi.10.1108/ARCH-11-2018-0019.

Love, Joan Scott. “How Autism-Friendly Architecture Can Change Autistic Children’s Lives.” *The Conversation*, 31 July, 2019. Accessed January 8, 2020. https://theconversation.com/how-autism-friendly-architecture-can-change-autistic-childrens-lives-120516

Moor, Julia. *Playing, Laughing and Learning with Children on the Autism Spectrum.* London: Jessica Kingsley Publishers Ltd., 2002.

Mostafa, Magda. “Designing for autism: an ASPECTSS™ post-occupancy evaluation of learning environments.” *Archnet-IJAR: International Journal of Architectural Research 12,* no. 3, (2018): 308-326. Accessed January 8, 2020. doi: 10.26687/archnet-ijar.v12i3.1589.

National Autistic Society. “Consultation on Improving Lives.” London, February 2017.

National Autistic Society. “Creating an autism friendly and safe space.” Accessed January 8, 2020. https://www.autism.org.uk/about/family-life/in-the-home/environment.aspx

National Autistic Society. “Sensory Differences.” Accessed January 8, 2020. https://www.autism.org.uk/about/behaviour/sensory-world.aspx

National Autistic Society. “The Autism Employment Gap.” Accessed January 8, 2020. file:///C:/Users/Joan/Downloads/TMI%20Employment%20Report%2024pp%20WEB.pdf

Parkerson, Elissa, A. *Art for Autism: Enhancing the Lives of Children.* USA: CreateSpace, 2010.

Salama, Ashraf, M. *Spatial Design Education: New Directions for Pedagogy in Architecture and Beyond.* London: Routledge, 2015.

Salama, Ashraf, M. "Prospects for research in architecture and urbanism." *Archnet-IJAR: International Journal of Architectural Research 13,* no.1, (2019): 2-7. Accessed January 8, 2020. doi: 10.1108/ARCH-02-2019-0029.

Sara, Rachel, and Matthew Jones. “The University as Agent of Change in the City: Co-creation of Live Community Architecture.” *Archnet-IJAR: International Journal of Architectural Research 12,* no.1, (2018): 326-337. Accessed January 8, 2020. doi: 10.26687/archnet-ijar.v12i1.1286.

Scott, Iain. “Designing Learning Spaces for Children on the Autism Spectrum.” *Good Autism Practice 10*, no.1, (2009): 36-51. Accessed January 8, 2020. doi: 10.1080/14606925.2017.1352738.

Serres, Michel. *The Five Senses: A Philosophy of Mingled Bodies.* London: Bloomsbury, 2008.

Souter-Anderson, Lynne. *Making Meaning: Clay Therapy with Children and Adolescents.* Buckingham: Hinton House publishers, 2015.

Taylor, Julie. L., and Marsha M. Seltzer, M. “Employment and Post-Secondary Educational Activities for Young Adults with Autism Spectrum Disorders During the Transition to Adulthood.” *Journal of Autism and Developmental Disorders 41*, (2011): 566-574. Accessed January 8, 2020. doi: 10.1007/s10803-010-1070-3.

Tenorio, Rosangela, Monto Mami, and Rainer Hirth. “India Workshop: Partnering for a Socially Active Design Approach.” *Charrette 5*, no.1 (Spring 2018): 108-116. Accessed January 8, 2020.

Ťulák Krčmáriková, Zuzana, and Ivana Lessner-Listiakova. “Sensory aspects of art therapy work with clay.” Paper presented at the 5th SGEM International Multidisciplinary Scientific Conferences on Social Sciences and Arts, Varna, Bulgaria, August 26 – September 1, 2018.

UN General Assembly. “New Urban Agenda, Resolution adopted by the General Assembly on 23 December 2016, Seventy-first session, Agenda item 20.” Accessed January 8, 2020. https://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_RES_71_256.pdf

Vermeulen, Peter. *Autistic Thinking – This is the title.* London: Jessica Kingsley Publishers Ltd, 2001.

Wall, Kate, Claire Cassidy, Mhairi Beaton, Lorna Arnott, Carol Robinson and Elaine Hall. “‘Look who's talking’: Dilemmas of practice when eliciting the voices of young children.” Paper presented at the American Education Research Association Conference, Toronto, Canada, April 5-9, 2019.

Webster, Helena. “Facilitating reflective learning: Excavating the role of the design tutor.” *Journal of Art, Design and Communication in Higher Education 2*, no. 3 (2004): 101-111. Accessed January 8, 2020. doi: 10.1386/adch.2.3.101/0.

Webster, Helena. “Architectural Education after Schön: Cracks, Blurs, Boundaries and Beyond.” *Journal for Education in the Built Environment 3*, no. 2 (2008): 63-74. Accessed January 8, 2020. doi: 10.11120/jebe.2008.03020063.

Wenger, Étienne. *Communities of Practice: Learning, meaning, and identity.* Cambridge: Cambridge University Press, 1998.

Whitehouse, Anna. *Sketching in Clay.* UK: Anna Whitehouse, 2019.

Williams, Donna. *Autism: An Inside-Out Approach.* London: Jessica Kingsley, 1996.

World Health Organization and World Bank. “World report on disability.” Accessed January 8, 2020. https://www.who.int/disabilities/world_report/2011/report.pdf