Designing an autism-friendly mainstream school and classroom, a plan for the day and an activity, alongside a 2000-word reflective commentary explaining the approach

Harry Linfield

BSc Psychology

University of Sussex

Word count: 2000

Introduction

The main focus is on Mia, an 11-year-old with mild autism spectrum disorder (ASD), who is used to explore the characteristics of autism, how autism differs between individuals and the cognitive theories for autistic behaviour. It explains how a whole-school approach, classroom, plan for a day and activity in a main-stream school could be designed to be autism-friendly and meet the needs of Mia and autistic children generally. Furthermore, it evaluates the effectiveness of various adjustments.

Autistic Spectrum Disorder

According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), autism is diagnosed as "persistent deficits in social communication and social interaction across multiple contexts [and] restricted, repetitive patterns of behaviour, interests, or activities" (APA, 2013, as cited in Autism Speaks, 2014, p. 2). Similarly, the International Classification of Diseases (ICD-11) classifies autism as "social communication deficits and restricted, repetitive and inflexible patterns of behaviour, interests or activities" (Reed et al., 2019, pg. 9).

Previously, autism was classified into different types, such as autistic disorder, Asperger's disorder and pervasive development disorder – not otherwise specified (PDD-NOS) in the DSM-4 (Doernberg & Hollander, 2016; Masi et al., 2017) and childhood autism and Asperger's disorder in the ICD-10 (Doernberg & Hollander; Reed et al., 2019). However, as of the DSM-5, the different types of autism were replaced with a single autistic spectrum disorder diagnosis (Doernberg & Hollander; Masi et al.) and the ICD-11 is expected to transition to this classification as well (Doernberg & Hollander; Reed et al.). Children with autism show a 'Triad of Impairments'– they have deficits in social communication and social interaction and show repetitive/restricted behaviours and interests (RRBIs) (Demetriou et al., 2018; Doernberg & Hollander, 2016; Frith et al., 1994; Karkhaneh, 2012; Lind & Williams, 2011; Masi et al., 2017; Milton, 2012; Pellicano, 2011; Reed et al., 2019; Wing & Gould,



1979). Additionally, autistic children often have sensory issues – they can be highly responsive to certain stimuli (hypersensitivity) and highly unresponsive to other stimuli (hyposensitivity) (Ben-Sasson et al., 2009; CRAE, 2015; Lal & Shahane, 2006; Milton) and can switch from high arousal to low arousal very quickly (CRAE). Furthermore, receiving too much sensory information can make autistic children anxious (sensory overload) (Ben-Sasson et al.; CRAE; Lal & Shahane; Milton). However, autistic children also perform behaviours to acquire sensory information (sensory seeking), such as feeling objects for their texture (Ben-Sasson et al.; CRAE).

The spectrum refers to how individuals with autism vary widely in the type and severity of autistic characteristics they show (Doernberg & Hollander, 2016; Masi et al., 2017; Reed et al., 2019). For example, Connor demonstrates social communication difficulties through his language comprehension issues whereas Mia's language is unimpaired. Additionally, Mia demonstrates RRBIs through her desire for routine and dislike of departure from that routine whilst Connor prefers a routine but is not as negatively affected by departure from it. Furthermore, Mia shows hyposensitivity through her strong desire to run around and be active whereas Connor shows hypersensitivity because he is quickly overwhelmed by incoming information, although, neither Mia nor Connor appear to have difficulties in social interaction.

There are several cognitive theories for autism. Firstly, executive function refers to various behaviours managed by the frontal lobes (Happé & Frith, 2006; Lind & Lobe Williams, 2011; Pellicano, 2011), such as switching attention between tasks (Demetriou et al., 2018; Lind & Williams; Milton, 2012; Pellicano) and inhibiting actions (Demetriou et al.; Lind & Williams; Pellicano). In autism, these executive functions are impaired (Demetriou et al.; Lind & Williams; Milton; Pellicano), which may explain the RRBIs shown by children with autism (Demetriou et al.; Lind &

Williams; Pellicano).

Secondly, theory of mind (ToM) refers to the ability to understand that people have separate mental states and to use this understanding to predict other people's behaviours and beliefs (Frith et al., 1994; Gernsbacher & Yeargeau, 2019; Lal &

Shahane, 2006; Lind & Williams, 2011; Milton, 2012; Pellicano, 2011). In autism, ToM is either absent (Frith et al.; Gernsbacher & Yeargeau; Lal & Shahane; Pellicano) or impaired (Frith et al.; Gernsbacher & Yeargeau; Lal & Shahane; Lind & Williams; Milton; Pellicano). The absence or impairment of ToM may explain why autistic children find Figure 4. A Navon task.

communication and social interaction difficult (Frith et al.; Lind & Williams; Pellicano).





Figure 3. Perspective-taking.





Finally, central coherence refers to the ability to combine small details into the big picture and to process the whole situation (Happé & Frith, 2006; Lind & Williams, 2011; Milton, 2012; Pellicano, 2011). Autistic children have weak central coherence (WCC) and are biased towards processing the small details whilst showing reduced processing of global information (Happé & Frith; Lind & Williams; Milton; Pellicano). This bias for small details and neglect of the big picture may explain social communication difficulties, social interaction difficulties, RRBIs (Happé & Frith; Pellicano) and sensory differences in autism (Happé & Frith; Lind & Williams; Pellicano).

Whole-school Approach

The whole-school approach is based around UDL (Universal Design for Learning). UDL suggests designing the educational environment to be flexible to learners' needs and to minimize barriers in educational participation (Al-Azawei et al., 2016; Izzo, 2012; Milton et al., 2016). This involves providing multiple means of engagement (different formats of teaching), representation (representing information through different senses) and expression (different methods for testing students) (Al-Azawei et al.; Izzo; Milton et al.). Evidence suggests UDL enhances student motivation and reduces barriers to learning and that teachers trained in UDL are superior at providing engagement, representation and expression (Al-Azawei et al.). Subsequently, teachers will be trained in UDL to implement it more effectively.

For engaging autistic children, the school will provide different formats of teaching, such as problem-solving, quizzes, discussions and lecturing. This reduces barriers to learning by providing formats of teaching that engage autistic children (Al-Azawei et al., 2016). Additionally, students will be allowed to work alone or with others (Milton et al., 2016), which should meet Mia's desire to work with a team. For representation, information will be presented through sound and vision. For example, textual information will be accompanied by pictures. This avoids disadvantaging visual learners by teaching only through sound (Izzo, 2012). Additionally, learning is more effective when information is taught through multiple senses (Izzo). Furthermore, some tasks will be hands-on to support kinaesthetic learners, such as practical tasks in science classrooms. This supports Mia's need for activities that are 'doing' rather than 'listening'. For expression, children's knowledge will be assessed through a variety of tasks, such as presentations, exams, essays and projects. Assessing students through different tasks enhances their motivation and learning (Al-Azawei et al.). Additionally, this may help with Mia's anxiety around test conditions, as she can opt-in for an alternative mode of assessment that is not invigilated, such as a take-away essay or project.

Furthermore, it has been suggested that educators should consult with both parents (CRAE, 2015; Lal & Shahane, 2006) and the autistic child to identify the child's needs (CRAE). Subsequently, the school will discuss Mia's needs with Mia and her parents. The information provided will be used to inform further physical or sensory adaptations for Mia. For example, if Mia and her parents stated she needed someone to direct her around the school, then this further adjustment could be provided.

Classroom Design

The classroom design is based on the TEACCH (Treatment and Education of Autistic and Communication Handicapped Children) approach to intervention. Evidence suggests the TEACCH approach improves autistic children's social behaviour, maladaptive behaviour (Virues-Ortega et al., 2013) and ability to work independently (Lal & Shahane, 2006).

According to TEACCH, the classroom should be clearly structured (Lal & Shahane, 2006; Virtues-Ortega et al., 2013). Specifically, different areas of the classroom should be

physically separated and this separation should be visually clear (Lal & Shahane). Physically organised classrooms enhance learning, ease transition between routines, minimise auditory and visual distractions and help autistic children to work independently (Lal & Shahane). So, in Mia's classroom, each area (students' seating, teacher's desk and whiteboard, drawers containing the students' work and quiet workstations) will be separated and not intermixed. There will also be lines marking the floor to show where each area begins and ends with labels indicating what each area is for. This will help Mia to be organised because it will be made clear where she can get her work from, where she should be working and where the teacher should be if she needs assistance. Likewise, it will help meet her need for control and structure due to the clear arrangement.

Additionally, TEACCH recommends the provision of quiet areas (Milton et al., 2016). This is important as autistic children are often hypersensitive and can easily be overwhelmed by incoming sensory information, which can make them anxious (Ben-Sasson et al., 2009; CRAE, 2015; Lal & Shahane, 2006). Thus, the classroom will have several cubicles where children can work quietly. Furthermore, autistic children can become understimulated very quickly (CRAE). Therefore, the classroom will be located near the playground, so children can go there to move around if they feel under-stimulated. This is important for Mia, as her desire for activity suggests she might be hyposensitive.

Similarly, TEACCH recommends that the classroom should be visually organised in ways that avoid sensory overload (Lal & Shahane, 2006). Sensory overload is often a source of anxiety for autistic children (Ben-Sasson et al., 2009; CRAE, 2015; Lal & Shahane). Subsequently, the classroom's colours will be neutral to avoid overstimulation (Milton et al., 2016) and lights will be adjusted so they are not fluorescent or flickering (CRAE).



Figure 5. Visual and textual representation of the school layout, including a classroom and playground.

Plan for the Day

Autistic children often show a strong desire for inflexible routines (Milton, 2012). Mia is one such child. Subsequently, she is provided with a personal timetable, outlining her routine for the day textually and visually. Looking at her visual timetable allows Mia to know what to expect for the day (CRAE, 2015; Lal & Shahane, 2006; Milton et al., 2016), helping to meet her desire for control through routine. Additionally, knowing what is happening ahead of time helps Mia to adjust to any changes in her routine (CRAE; Lal & Shahane; Milton et al.), which helps with managing her inflexibility and avoiding anxiety once she gets home. Furthermore, the visual timetable helps Mia to manage incoming sensory information, as she knows what to expect from the situation she is entering (CRAE). Additionally, the

timetable is provided in visual

Figure 6. *Textual and visual timetable of Mia's school day*. Mia. format as this works better for



8:00am – 8:30am Travelling to School



11:30am – 12:30pm English





12:30pm – 1:30pm Geography



9:00am – 10:00am Maths



1:30pm – 2:15pm Lunch Time



10:00am – 11:00am Science



2:15pm – 3:15pm Art and Design



11:00am - 11:30am

Break Time



3:15pm – 3:45pm Travelling Home

Activity

Mia is anxious about being told off for looking around during an exam if she is nervous. Subsequently, she will participate in a Social Story teaching that it is okay to look around during exam conditions. A Social Story describes a specific situation and explains the appropriate behaviour for that situation and aims to teach the listener to behave that way (Saad, 2016; Karkhaneh, 2010). They can be presented through text, visuals, sound and video (Saad; Karkhaneh). They have been shown to improve autistic children's ability to regulate emotions (Saad) and enhance their social behaviours (Saad; Karkhaneh). Subsequently, it should help Mia's anxiety around test conditions by assuring her that she will not be punished for looking around and communicating to her that other people understand her concern.

Figure 7. Visual and textual Social Story about exam



 When I am doing a test, I may need to look around.



 Other students may also be anxious and looking around.



2) I am worried about being told off for this.



5) When I am anxious, I will look around because it is okay to do so.



3) Everyone is okay with me just looking around.



6) Staff members will not tell me off for just looking around.

Conclusion

Mia's needs and the needs of autistic children generally have been met through the UDL and TEACCH approaches to educational design. According to evidence, these should contribute towards the autism-friendliness of the school and its ability to meet autistic children's needs, although, since autism is a spectrum condition, the solutions proposed are not exhaustive. This is the key problem for autism in education – creating an environment that meets the needs of all autistic children. Therefore, schools should be designed to meet autistic needs generally but provide individualised adjustments for those with more specific needs.

References

Al-Azawei, A., Serenelli, F., & Lundqvist, K. (2016). Universal Design for Learning (UDL):

A content analysis of peer reviewed journal papers from 2012 to 2015. Journal of the

Scholarship of Teaching and Learning, 16(3), 39-56.

DOI:10.14434/josotl.v16i3.19295

APA (2013). Diagnostic and statistical manual of mental disorders (5th ed.). Washington,

DC: American Psychological Association.

Autism Speaks (2014, August 10). Autism diagnosis criteria: DSM-5.

https://www.autismspeaks.org/autism-diagnosis-criteria-dsm-5

- Ben-Sasson, A., Hen, L., Fluss, R., Cermak, S. A., Engel-Yeger, B., & Gal, E. (2009). A meta-analysis of sensory modulation symptoms in individuals with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, *39*(1), 1-11.
 DOI:10.1007/s10803-008-0593-3
- CRAE (2015, October 5th). Sensory issues in autism: How you can help. Issuu. https://issuu.com/crae.ioe/docs/sensory_booklet_final_sr
- Demetriou, E. A., Lampit, A., Quintana, D. S., Naismith, S. L., Song, Y. J. C., Pye, J. E.,

Hickie, I., & Guastella, A. J. (2018). Autism spectrum disorders: A meta-analysis of executive function. *Molecular Psychiatry*, 23(5), 1198-1204.

DOI:10.1038/mp.2017.75

Doernberg, E., & Hollander, E. (2016). Neurodevelopmental disorders (ASD and ADHD): DSM-5, ICD-10, and ICD-11. *CNS Spectrums*, 21(4), 295-299.

DOI:10.1017/S1092852916000262

- Frith, U., Happé, F., & Siddons, F. (1994). Autism and theory of mind in everyday life. Social Development, 3(2), 108–124. DOI:10.1111/j.1467-9507.1994.tb00031.x
- Gernsbacher, M. A., & Yergeau, M. (2019). Empirical failures of the claim that autistic people lack a theory of mind. Archives of Scientific Psychology, 7(1), 102-118. DOI:10.1037/arc0000067

Happé, F., & Frith, U. (2006). The weak coherence account: Detail-focused cognitive style

in autism spectrum disorders. *Journal of Autism and Developmental Disorders*, *36*(1), 5-25. DOI:10.1007/s10803-005-0039-0

Izzo, M. V. (2012). Universal Design for Learning: Enhancing achievement of students with disabilities. *Procedia Computer Science*, *14*, 343-350.

DOI:10.1016/j.procs.2012.10.039

- Karkhaneh, M., Clark, B., Ospina, M. B., Seida, J. C., Smith, V., & Hartling, L. (2012).
 Social Stories[™] to improve social skills in children with autism spectrum disorder: A systematic review. *Autism: The International Journal of Research and Practice*, 14(6), 641-662. DOI:10.1177/1362361310373057
- Lal, R., & Shahane, A. (2006). TEACCH intervention for autism. In T. Williams (Ed.), Autism spectrum disorders: From genes to environment (pp. 169-190). InTech.
- Lind, S. E., & Williams, D. M. (2011). Behavioural, biopsychosocial, and cognitive models of autism spectrum disorders. In Matson, J. L., & Sturmey, P. (Eds.), *International handbook of autism and pervasive developmental disorders* (pp. 99-114). Springer Science & Business Media.
- Masi, A., DeMayo, M. M., Glozier, N., & Guastella, A. J. (2017). An overview of autism spectrum disorder, heterogeneity and treatment options. *Neuroscience Bulletin*, *33*(2), 183-193. DOI:10.1007/s12264-017-0100-y
- Milton, D. (2012). So what exactly is autism? Autism Education Trust.

https://kar.kent.ac.uk/62698/

- Milton, D., Martin, N., & Melham, P. (2016). Beyond reasonable adjustment: Autistic friendly spaces and Universal Design. In D. Milton & N. Martin (Eds.), *Autism and intellectual disability in adults* (pp. 81-85). Pavilion Publishing and Media.
- Pellicano, E. (2011). Psychological models of autism: An overview. In I. Roth, & P. Rezaie
 (Eds.), *Researching the autism spectrum: Contemporary perspectives* (pp. 219-265).
 Cambridge University Press.
- Reed, G. M., First, M. B, Kogan, C. S., Hyman, S. E., Gureje, O., Gaebel, W., Maj, M., Stein, D. J., Maercker, A., Tyrer, P., Claudino, A., Garralda, E., Salvador-Carulla, L., Ray, R., Saunders, J. B., Dua, T., Poznyak, V., Medina-Mora, M. E., Pike, K. M., ...
 Saxena, S. (2019). Innovations and changes in the ICD-11 classification of mental, behavioural and neurodevelopmental disorders. *World Psychiatry*, *18*(1), 3-19. DOI:10.1002/wps.20611
- Saad, M. A. E. (2016). The effectiveness of social stories among children and adolescents with autism spectrum disorders: Meta-analysis. *International Journal of Psycho-Educational Sciences*, 5(2), 51-60.

https://www.journals.lapub.co.uk/index.php/IJPES/article/view/137

Virues-Ortega, J., Julio, F. M., & Pastor-Barriuso, R. (2013). The TEACCH program for children and adults with autism: A meta-analysis of intervention studies. *Clinical Psychology Review*, 33(8), 940-953. DOI:10.1016/j.cpr.2013.07.005

Wing, L., & Gould, J. (1979). Severe impairments of social interaction and associated

abnormalities in children: Epidemiology and classification. Journal of Autism and

Developmental Disorders, 9(1), 11-29. DOI:10.1007/BF01531288

Appendix A

Mia's Profile

Year 7

Things we like about Mia

- She is full of fun and has a beautiful smile. She
- is reliable and tries her hardest with everything!
- Mia shares what she knows with other people,
- she is a good study buddy and a good leader.
- She is full of fun and a bundle of energy!

What's Important to Mia at school

- Not to be late for school
- To be organised, to have everything she needs for the day
- To feel in control, to have a structured, calm day and know what is happening next and to have an explanation if things have to be cancelled
- To have a job to do and some responsibility, Mia is very reliable
- Not to be in trouble, Mia sees it as a big thing if she is told off and it upsets her
- To play and run around and be active in PE and play time – this is "extra ultra important" to Mia. She much prefers team sports
- To have someone to play with. Not to fall out with her friends – this really makes Mia sad
- Not to feel under pressure. Mia says that she worries she'll get in trouble for looking around when she is "under test conditions" but she can't help looking around when she is nervous
- To be herself and to do her best, be noticed for doing hard work and told well done
- To be fair Mia has a real sense of justice and doesn't like it when people break the rules or tell lies and it isn't sorted out
- To have a healthy lunch she likes and someone to have lunch with
- To have lessons that are doing rather than listening
- Not to go on her own to places that are dark or in secluded areas
- To be part of a team, to have an activity to get involved in
- To share a table at school with children who she gets on with, no personality clashes
- To have enough sleep on a school night

How to help Mia have good days at school

- Be aware that it is very important to Mia to have everything that she needs for her day. If she does forget something, please support her by letting her phone home to have it dropped off, it will make a big difference to her day.
- Remember that Mia having all that she needs for her day includes homework, so please support her by giving her homework slips at the end of lessons. This helps Mia to be organised and reassures her that she will know what she needs to do once she is at home
- Feeling in control is something that really matters to Mia. At the moment Mia's year 6 class has a visual timetable and this works very well for her. If something isn't going to happen that she is expecting, please explain why. She may not show she is concerned about this at the time but will be very upset when she gets home.
- Mia is really helpful and loves to have a job to do. Be aware of this and give her every opportunity to make her contribution.
- Mia takes it to heart when she is told off. Please be sensitive to this
- Remember that Mia is a bundle of energy; she is a very active girl. If there are clubs or after school activities that she may like, point them out to her, especially if there is a team to join!
- "Test conditions" worry Mia as she is concerned she'll get in trouble for looking around if she is nervous.
 Support by knowing this and understanding her worry about being told off.
- Mia always tries hard. A well done goes a long way!!
- Know that Mia feels strongly about fairness. Support her by reassuring her about this is she is involved and reminding her she doesn't have to worry if she isn't!
- Falling out with friends and not having someone to play with makes Mia really sad. She may not tell you she is upset but you can see it in her face. Keep a look at for a sad day and support her by offering her the chance to say what's wrong. She will let you know if she wants you to step in or sort it out herself

We also think that...

Mia is really kind, caring and helpful. She is a brilliant dancer and a great hockey player – she just gets stuck in! Mia is sweet and polite

Mia's Case Study

Appendix B

Connor – one page profile

What others like and admire about Connor

Very caring towards others and concerned if they are ill or upset Good singer, good friend, funny, helpful, very good boy Being a good big brother to Amelia making sure she's safe. Being loving Good sense of humour. Cheeky

Connor's story

Connor is eleven years old and has a dual diagnosis of speech, language and communication difficulties and autistic spectrum disorder. He is very caring and loves singing and drama. His personality endears him to adults and he has built some good friendships. He speaks as he finds and has a sense of humgur, if the joke isn't on him. He lives at home with both parents and has a younger sister.

What's important to me?

Playing Skylanders most days. It's a Play Station 3 game. They are heroes who save Skylands from the dark forces such as Chaos and Arkeyans.

Eating healthy food like fruit. My favourite fruit are apples.

Building with Lego. I build something new every time. I like playing with Lego on weekends and in school holidays Racing against dad when we play 'Sonic All Stars Racing Transformed' on dad's Play Station 3 in the holidays. The people I see in school are important to me because they help me with my work.

How best to support me

Sometimes I get my maths wrong when I rush. Remind me to stay calm and take my time so I can think about what I am doing.

I take longer than others to process language and understand questions that you ask of me I respond well to some use of pictures to support your use of language but I don't like the pictures to be 'babyish' If I have a problem at break times, I like to try and sort it out on my own. Sometimes I need an adult to help me sort it out.

If I get a note wrong when I'm singing I get annoyed with myself. Tell me that it is okay.

If someone hurts me it pushes my big red button which means I am really angry. A teacher should remind to calm down and tell me that if I hit them back I will be in trouble and this helps me to calm down.

I get very anxious very quickly, have a calm environment to escape to and helping me by telling me what is going to happen each day can be really helpful.

(with thanks to Helen Sanderson Associates)

Connor's Case Study