

# Examining Supportive Educational Environments for Young Children with Autism Spectrum Disorder (ASD)

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## Purpose

As of December 2009, there were 14,646 children with ASD in Minnesota's public school system (Autism Spectrum, 2009). While guidelines have been identified for teaching students with ASD, none address the physical learning environment. Research is necessary to determine appropriate design interventions in learning environments as they pertain to the needs of these children with ASD so that children with ASD will be physically, psychologically, socially, and educationally supported.

## Process

This UROP project was an iterative process in which I not only conducted research, but learned about research and the literature review process. This project is the beginning of a larger study which will be carried out by my sponsor. The process we used was as follows:

1. Introduction to the literature review process and research vocabulary
2. Gathered literature
  - Over 1/3 of my time was spent here
  - Used consistent search terms such as: autism, classroom, school, learning, design, environment, light source, and color
  - Located 37 pieces of relevant literature
    - Peer reviewed journals (21)
    - Refereed conference proceedings (2)
    - Trade publications (4)
    - "Other" sources (10)
3. Reviewed the six most relevant pieces of literature and created an annotated bibliography. Articles were chosen based on relevancy to the project topic in terms of age, environment, ability, and focus on the built environment's impact on students with ASD.
  - Refereed journals (3)
  - Refereed conference proceedings (1)
  - Trade publications (2)
4. Develop a matrix highlighting specific design criteria for learning environments for children with ASD
  - Matrix identifies type of literature source, type of study conducted, sample description, variables studied, outcomes measured, findings, and design criteria for each reviewed source

## Results

While the studies described in the literature varied in their focus, there were some commonly cited design criteria:

- Provide generously sized circulation spaces (e.g., ample space between activity areas)
- Define spaces with clear visual boundaries such as storage units, screens, tape on the floor, etc.
- Minimize distractions, especially in individual workstations by facing them towards a blank wall or provide screens around the desk
- Provide blinds or draperies for the windows to minimize distractions, but include clerestory windows whenever possible to retain some natural light
- Allow for direct sight lines between the teacher and the students within the classroom
- Include transition areas between areas of high stimulation and those of low stimulation
- Include a separate quiet area for over-stimulated students to calm down
- Incorporate visual schedules into the design, placing them in highly visible areas
- Place classroom with direct access to restrooms
- Include ample storage in the design

Overall, the results of this study indicated how little information is available concerning the effects of the physical learning environment on the physical, psychological, social, educational needs and well-being of children with ASD. With my sponsor, the following limitations were identified: none of the design criteria were actually tested on children with autism and the sample sizes were considerably small overall, limiting generalizability.



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## References

Autism Spectrum Disorder Task Force. (2009). *Final Report*. For more information about literature used, please see complimentary paper or contact Dr. Martin at [cmartin@umn.edu](mailto:cmartin@umn.edu)

## Images

Autistic boy. (2012). [Web Photo]. Retrieved from <http://psychcentral.com/news/2012/10/15/classroom-yoga-improves-behavior-of-kids-with-autism/46081.htm>

Deloya, H. (Photographer). (2012). Retrieved from <http://autismtank.blogspot.com/2012/09/teaching-strategy-4-schedules.htmlw.kennedykrieger.org/special-education>

[Web Photo]. Retrieved from <http://psychcenthttp://tips.blogs.cnn.com/2009/03/30/signs-of-autism-spectrum-disorder>

[Web Photo]. Retrieved from <http://www.kennedykrieger.org/special-educationhttp://psychcenthttp://tips.blogs.cnn.com/2009/03/30/signs-of-autism-spectrum-disorder/ral.com/news/2012/10/15/classroom-yoga-improves-behavior-of-kids-with-autism/46081.htm>

[Web Photo]. Retrieved from <http://www.specialed.us/autism/structure/str11.htm>