

# Effectiveness of Virtual Reality Calm Room Interventions on Student Behaviors

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**PURPOSE:** The occupational therapy scope of practice supports virtual interventions to support occupational performance and participation (AOTA, 2020). Many OT prescribed regulation strategies result in student removal from the classroom to sensory rooms, which violates learning in the 'least restrictive environment' according to the Individuals with Disability Education Improvement Act (IDEA, 2004). A virtual experience has been motivating and effective to reduce anxiety in children with Autism Spectrum Disorder (ASD) (Maskey, Lowry, Rodgers, McConachie, & Parr, 2014). With the prevalence of cell phones, Ipods, and \$25.00 headsets, the individualized VR experience is cost effective compared to physical sensory rooms. The purpose of this feasibility case study was to determine whether a VR 'calm room' intervention improved observable student behaviors, re-engagement times, regulation state, and timed reduction of need for intervention, compared to previously prescribed regulation interventions.

**DESIGN:** A convenience sample of four children, aged 4-14, with diagnosed ASD or Sensory Processing Disorder were selected by their behavioral therapists due to the child's consistent need for regulation of exhibited negative behaviors to resume participation following adult-directed requests for occupation or engagement. The two-phase quasi-experimental study compared observed and self-reported regulation states, timed use, and response data using the child's prescribed calming methods, and the use of a VR 'calm room' as an alternative intervention.

**METHOD:** The six-week data collection period was divided into two three-week comparative intervention phases. The data collection form was simplified to short answers for behavior descriptions and requested tasks, a visual Likert scale to quantify regulation state for the child and informant, yes/no responses, pre-populated values for numerical intervention use time, and the timing of post-use return to participation to target real time responses during educational tasks. Due to the small number of participants and limited data points, descriptive statistics were used to report individual and group mean change values for each intervention phase, for timing of intervention utilization and re-engagement, child-perceived, and reported regulation state.

**RESULTS:** There was a 93% improvement (group mean change from 245 to 17 seconds) in intervention time required to observe behavior improvement when using VR compared to other interventions. Resumed participation times for the requested occupation also decreased by 63% (group mean of 93 to 34 seconds) with the use of the VR experience. In intervention comparisons using group mean change values, three of four children self-reported a 25% improvement in regulation state to acceptable levels with VR. Informants reported a 54% improvement of regulation state from pre- to post-VR intervention use.

**CONCLUSIONS:** The preliminary effectiveness of a virtual reality calm room supports the feasibility of a VR intervention to reduce maladaptive behavior duration, intervention duration, and improve the regulation state of children aged 4-14 diagnosed with Autism Spectrum Disorder and/or Sensory Processing Disorders to be able to participate in structured settings with adult directed requests. Despite the need for additional research in larger educational settings, this preliminary study has the potential to positively impact school based occupational therapy practice with a calming intervention modality that is cost-effective, motivating, classroom friendly, and improves student participation through improved regulation state.

## References

- American Occupational Therapy Association. (2020). Position Statement Occupational Therapy Scope of Practice: pre-publication draft. <https://www.aota.org/-/media/Corporate/Files/Practice/Manage/official%20docs%20prepublication/ajot-75S3005-OT-Scope-of-Practice-aota.pdf>
- Individuals with Disabilities Education Improvement Act of 2004, 20 U.S.C.33 (2004). <https://uscode.house.gov/view.xhtml?path = /prelim@title20/chapter33&edition = prelim>
- Maskey, M., Lowry, J., Rodgers, J., McConachie, H., & Parr, J. R. (2014). Reducing specific phobia/fear in young people with autism spectrum disorders (ASDs) through a virtual reality environment intervention. *PLoS one*, 9(7). <https://doi.org/10.1371/journal.pone.0100374>