

The Impact of Furniture Layout on Social Interaction of Visually Impaired Pre-schoolers: A Case Study of All'bout Montessori School

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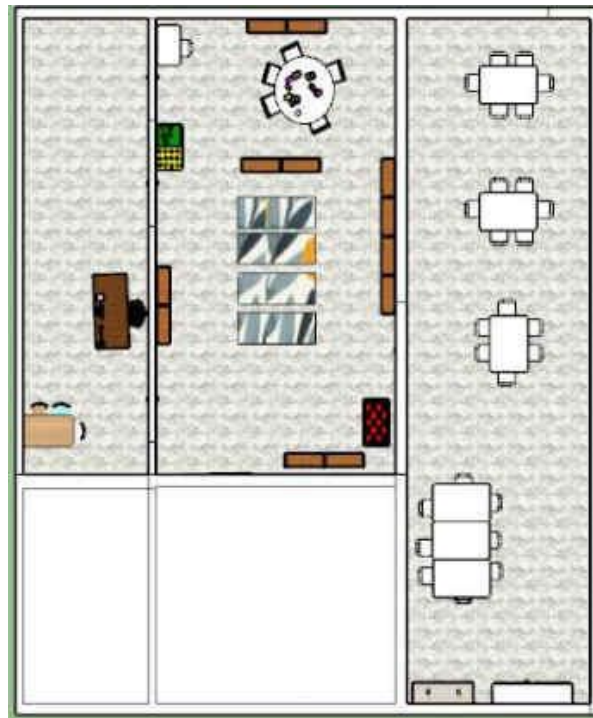
Abstract – Social interaction plays a crucial role in early childhood development, promoting key skills in communication, cooperation, and emotional growth. This research examines how the layout of classroom furniture impacts social interaction among visually impaired preschoolers in an inclusive setting at All'bout Montessori School in Ratmalana, Sri Lanka. The study focuses on how specific furniture arrangements affect essential aspects of social engagement, including verbal and non-verbal communication, cooperative play, conflict resolution, and helping behaviours between visually impaired and sighted children. With limited literature addressing the physical environment's influence on social interaction in inclusive classrooms, this research fills an essential gap by investigating how intentional design can support the social needs of visually impaired children. This study employed a mixed-methods approach to explore these dynamics comprehensively. Qualitative observations were conducted to document real-time social behaviours, while structured interviews with teachers and questionnaires from parents provided additional insights. Data collection centred on three primary zones in the classroom: sensory, study, and play areas, each designed to serve different interaction and learning purposes. Ten preschoolers who are visually impaired and sighted, three teachers, and five parents participated offering a diverse perspective on how the spatial layout influenced social behaviour across various classroom activities. Findings revealed that the sensory zone, specially tailored for visually impaired children, promoted higher levels of engagement and facilitated meaningful interactions, bridging gaps in communication with sighted peers. Tactile, auditory, and olfactory cues within this zone enabled children with visual impairments to navigate the space comfortably, resulting in increased interaction through shared experiences. This sensory-rich environment stimulated non-verbal communication and cooperative behaviours, with sighted children guiding their visually impaired peers in discovering and using objects within the space. This aligns with existing research on sensory inclusion, affirming the importance of multi-sensory design in promoting inclusivity. Conversely, the study zone, configured for solitary work, was less conducive to social engagement, highlighting the need for balanced space design to support both individual learning and collaborative activities. While the study area allowed focused learning, it offered fewer opportunities

for social interaction, indicating that inclusive classrooms benefit from flexible zones that encourage both solitude and group activities. Literature on classroom design similarly emphasises the importance of collaborative spaces to support social development in children with disabilities. The play area provided a semi-structured layout that effectively supported spontaneous social interactions, cooperative play, and role-playing activities accessible to both visually impaired and sighted children. Here, sighted peers were often seen guiding visually impaired children in play activities, promoting inclusivity and empathy. The play area allowed for skills in turn-taking, role negotiation, and conflict resolution to emerge naturally, reinforcing findings from prior studies that emphasise the value of unstructured play for developing social skills, particularly in inclusive environments. This cooperative play environment was particularly effective in creating a sense of community among children, underlining the need for inclusive classrooms to facilitate diverse learning and play zones that promote social cohesion. This research provides valuable insights into how specific furniture layouts can impact the social interactions of visually impaired preschoolers. By designing accessible spaces that cater to various interaction levels, educators and designers can better support inclusivity and social development in early childhood settings. Furthermore, this study establishes a foundation for future research on inclusive classroom design, particularly in sensory-rich environments that promote interaction across different abilities. The findings suggest that educators should consider multi-sensory elements when designing inclusive classrooms, ensuring that children with diverse needs can engage fully with their environment and peers. In conclusion, this research underscores the significance of purposeful furniture layout in promoting social engagement and inclusivity for visually impaired preschoolers. The sensory, study, and play areas each contributed uniquely to the children's social experiences, demonstrating the importance of diverse, accessible classroom designs. These insights not only fill a gap in the literature but also offer practical recommendations for creating inclusive learning environments that stimulate meaningful social interactions. By implementing design strategies that prioritise accessibility and sensory engagement, educators can cultivate classroom spaces that build up the social and educational experiences of all preschoolers, regardless of ability.

Keywords: Furniture layout, social interaction, visually impaired preschoolers, inclusive education, and classroom design

Figure 1

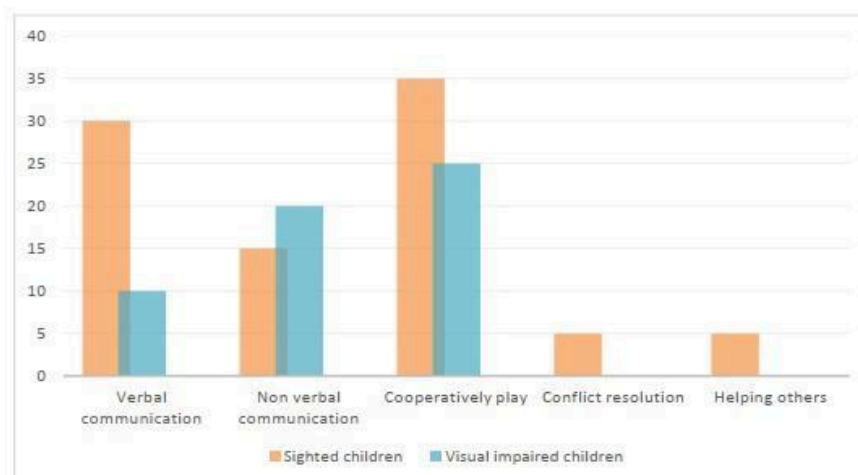
Illustration of existing furniture layout of All'Bout Montessori School



Note. Created by the author

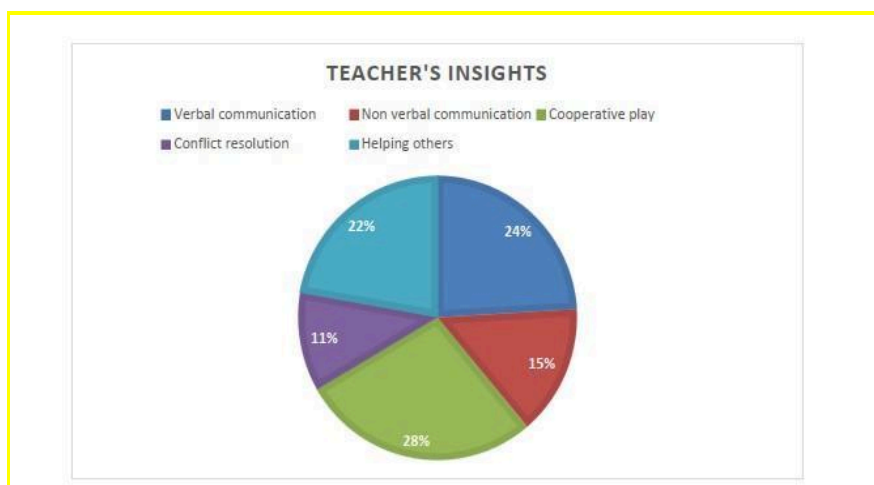
Figure 2

Social Interactions occurred in Existing furniture



Note. Created by the author

Figure 3
Descriptive Analysis of the Teachers' Responses



Note. Created by the author

References

- Arter, C. (1997). *The primary school child*. David Fulton Publishers.
- Barrett, P. Z. (2013). A holistic, multi-level analysis identifying the impact of classroom design on pupils' learning. *Building and Environment*.
- Bodroya, L. (2007). A case study of implementing the Vygotskian approach in American early childhood primary classrooms. *International Journal of Educational Research*, 144-160.
- Christensen, R. (2014). The role of classroom design in inclusive education. *Journal of Learning Spaces*.
- Foschi. (2008). Science and culture around Montessori's first 'children's houses' in Rome. *History of the Behavioral Science*.
- Fujiwara, A., & S. S. (2022). Children's Social Interaction in preschool education and Childcare Settings: A systematic review.
- Hajivalie, E. A. (2022). Introducing several approaches to upgrade the interior of visually impaired children's preschools. *American Research Institute for Policy Development*.
- Jayawardena, P. (2016). *Institute of Policy Studies of Sri Lanka*.
- Johnson, A. S. (2019). Cultural influences on early childhood cognitive development: A literature review. *Journal of Child Development*.
- Kostelnik, M. J. (2015). *Developmentally appropriate curriculum: Best practices in early childhood education*. Pearson.
- Krischa Esquivel, E. E. (n.d.). The role of equity and diversity in early childhood education. *College of the Canyons*.
- Lillard, A. S. (2017). *Montessori: The science behind the genius*. Oxford University Press.
- Mihai, A. D. (2018). Seating arrangements in the classroom and their effects on student learning. *Procedia-Social and Behavioral Sciences*.
- Montessori, M. (1912). *The discovery of the child*. Clio Press, Oxford.
- Piaget, J. (1972). *The psychology of the child*.
- Ravenscroft, J. B. (2008). A novel method of studying visual impairments. *The British Journal of Visual Impairment*, 170-189.
- Roe, J. A. (1998). *Children with visual impairment: Social and developmental implications*. London: Routledge.
- Sutevski, D. (2023). The impact of classroom furniture on student engagement and academic performance.
- UNESCO. (2021). *Inclusive education in Sri Lanka*.
- Wilson. (2003). *Special educational needs in the early years*. London.