

Spatial intelligence in young children

Newcombe and Frick (2010) reviewed relevant literature to explore the importance of fostering spatial intelligence in young children. There is much research evidence to demonstrate that “mental spatial transformation abilities, while present in some precursory form in infants, toddlers, and preschool children, also undergo considerable development and show important individual differences, which are malleable” (p. 102).

Spatial thinking is a crucial type of thinking that is often overlooked in education. This type of thinking serves three important purposes: spatial intelligence has adaptive and evolutionary advantages, it is the “principal complement to verbal thinking”, and it aids thinking in other domains (p. 102). There is also a strong connection between spatial thinking and the STEM disciplines. “Children and adolescents who have higher spatial skills in middle and high school are more likely to major in the STEM disciplines in college and to pursue STEM careers” (p. 103). This has particular implications for girls, as women are less represented in the higher levels of STEM.

Research suggests that spatial thinking can be developed and enhanced in humans through spatial training and specific interventions. If spatial thinking is promoted in children, there may also be a “significant impact” on overall cognitive development (p. 106).

Spatial skills can be nurtured both inside and outside of the preschool classroom. “There are three areas in which caregivers and educators may seek to improve spatial skills: in preschool settings, through semi-structured use of media in the classroom or at home and by providing opportunities for free play” (p. 107). Structured activities such as introducing preschool children to maps can help them to explore perspective and elements of space. It is important that educators and parents interact with children. “Caregivers and educators can then provide children with spatial language that may help them categorize and abstract relevant aspects of their spatial environment, draw their attention to analogies and differences, or simply motivate thought and exploration of space” (p. 108).

Spatial training is durable over time and works “in a way that generalises to new stimuli and novel tasks” (p. 104). Individuals labelled as having low spatial ability can improve their spatial thinking through specific interventions. Even those “who are considered spatially proficient... can attain higher levels of performance” through training (p. 102).

The research evidence gathered by Newcombe and Frick (2010) clearly demonstrates that preschool is the ideal time for educators to develop spatial thinking skills in children. Spatial thinking can also be enhanced by caregivers in the home environment. The benefits of students who have strong spatial skills are numerous. Integrating “spatial content into formal and informal instruction could not only improve spatial functioning in general but also reduce differences related to gender and socioeconomic status that may impede full participation in a technological society” (p. 102).

Newcombe, N., & Frick, A. (2010). Early education for spatial intelligence: why what and how. *Mind, Brain and Education*, 4(3), 102-111.