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EDITORIAL

Teaching and learning science during the early years

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Abstract: Over the past two decades, science has increasingly become an integral part of early childhood curricula, and research on teaching and learning science in early years has emerged as an established field of study. Collectively, the findings of a growing body of literature suggest that introducing science in developmentally appropriate ways may support young children's learning of science concepts and scientific thinking skills. The increasing number of edited volumes and special issues, including this one, devoted to the topic of early childhood science teaching and learning indicates that early science education, as a field of study, will continue to attract researchers from early childhood and science education as well as educational and cognitive psychology.

Keywords
Early science education;
Preschool science education;
Teaching and learning of science

Research on the teaching and learning of science during children's early years of development has emerged as an established field of study over the past two decades. Collectively, the findings of a growing body of literature suggest that introducing science in developmentally appropriate ways may support young children's sensory explorations of their world and provide foundational knowledge and skills for lifelong science learning as well as a deeper appreciation of nature (Trundle, 2015; Trundle & Saçkes, 2012).

Despite the increasing number of research studies on early childhood science education, our knowledge about the teaching and learning of science during the early years remains limited compared to other domains such as literacy and mathematics (Trundle & Saçkes, 2012, 2015). Empirical studies, reviews, and policy analyses are needed to inform the theory and practice of teaching and learning of science in preschool and kindergarten classrooms.

The following research themes provide a foundation for further studies in the field (Siry, Trundle & Saçkes, in press): 1) development of children's scientific thinking and inquiry skills and how to support children as they engage with science; 2) play as a pedagogical tool for science learning and skill development; 3) children's emotions and motivation toward science; 4) the effectiveness of available science curricula and the design of developmentally appropriate science curricula for young learners; 5) accessibility of early science education for all children; 6) the integral link between science and language and young children's talk about and interaction with science concepts and phenomena; 7) the integration of science learning with other content domains; 8) outdoor and environmental education to support science learning; 9) family participation in young children's science learning; 10) educational materials and technology to support young children's science learning; and 11) parent and caregiver support of infants and toddlers as they begin to experience science concepts and skills.

The content of this special issue of the Journal of Childhood, Education & Society contributes to our understanding of several aspects of early science education including:

- how play-based inquiry activities support children's conceptual understanding of thermal-

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insulation and engagement with scientific and engineering practices (Fragkiadaki et al., 2021; Miller & Saenz, 2021)

- the role of language, question-explanation exchanges, and Dual Language Learning environment in learning science concepts (Åkerblom & Thorshag, 2021; Haber et al., 2021; Rumper et al., 2021)
- how early childhood teachers' perceptions of gender influence their science teaching practices (Hamel, 2021).
- how off-school visits promote young children's engagement with scientific inquiry and learning of science concepts (Roberts, 2021).
- The extent to which science concepts and skills are included in U.S. preschool curricula (Ocasio et al., 2021).

Teaching and learning science as inquiry during the early years should invite children to be cognitively, motivationally, and physically active participants in investigations where they ask questions, make observations and answer questions within the context of developmentally appropriate concepts and materials (Trundle & Saçkes, 2012). The findings of research studies over the last two decades, along with the studies included in this special issue, suggest that young children have potential to benefit from science learning opportunities (Carey, 2004; Güçhan-Özgül, 2021; Kuhn & Pearsall, 2000; Metz, 1997; Hobson, Trundle & Saçkes, 2010; Samarapungavan, Mantzicopoulos, &Patrick, 2008; Saçkes et al., 2020; Trundle & Saçkes, 2015).

Over the past two decades, science has increasingly become an integral part of early childhood curricula, and research on teaching and learning science in early years has emerged as an established field of study. The increasing number of edited volumes and special issues, including this one, devoted to the topic of early science teaching and learning indicates that early science education, as a field of study, will continue to attract researchers from early childhood and science education as well as educational and cognitive psychology.

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