

This is a pre-print, accepted version of:

Siry, C. (2024). Inclusive science education in the early years: A prologue. In G. Lemkow  
Tovias [Ed]. *Inclusive science education in the early years*. Graó publishers.

Available at:

<https://www.grao.com/libros/inclusive-science-education-in-the-early-years-79245?contenido=486408>

## **Inclusive science education in the early years: A prologue**

Christina Siry  
The University of Luxembourg

The term inclusion represents a commitment to making preschools, schools, and other education settings, places in which everyone is valued and belongs, and diversity is seen as enriching. (UNESCO, 2019)

The perspective that human diversity – in all of its brilliant and complex facets - is *enriching* is central to working towards inclusive education, as the above quote from the UNESCO organization underscores. All children have a right to an education (UNCRC, 1989) and the UNESCO Global Goals elaborate the need to ensure “inclusive and equitable quality education and promote lifelong learning opportunities for all”. This monograph highlights key considerations for an inclusive science education in the early years, emphasizing the significance of inclusion in different contexts for children to grow and learn, with diversity positioned as an enriching asset for science education, as the above quote underscores.

I was invited to contribute a prologue to this volume emergent from a keynote presentation that I delivered at the “Science since birth” international conference on early childhood science, hosted by the University of Manresa (2023). My presentation, *Creating structures for children’s embodied engagement in science: the value of time and space for meaning-making*, provided a view on how my team and I work towards spaces of inclusion in collaboration with pre- and in-service teachers through our work at the SciTeach Center at the University of Luxembourg (<https://sciteach.uni.lu>), a resource Center dedicated to supporting science education in Luxembourg’s primary and pre-primary school contexts. We support open-ended approaches to instruction in our collaborations with teachers, which we also accompany with research to try to better understand what they mediate, and how they support young children’s science participation, engagement, and learning. Over the years, our work has emphasized the complex, embodied, and brilliant ways in which children engage in interaction during science exploration, and taken as a whole, our research over the years underscores importance of creating open spaces for children to engage with science. The work being done at the SciTeach Center highlights how such spaces can provide teachers with opportunity to create science learning experiences from and with young children’s ideas and wonderings. It is from this positioning that the following brief reflections on possibilities for an inclusive science

education in the early years have emerged, building from my research over the years together with colleagues in the SciTeach team, exploring the complexities of young children's engagement in inquiry-driven science learning contexts.

### ***Science Education as an Inclusive Practice***

Inclusion, and inclusive education, are contested terms (Murdoch et al., 2020) which are used in differing ways in the literature. The notion of inclusion, taken broadly, refers to a quality education for all (Murdoch et al, 2020), and working towards inclusive education involves providing opportunities for *all* children to learn (UNESCO, 2019), thereby accepting and accommodating diversity among learners. I take a broad view on inclusion in school contexts as classroom environments that acknowledge, welcome, and build from difference so that children can engage and learn in their own ways, and on the overall our research considers the ways in which inquiry-oriented science education experiences in early childhood can be inclusive opportunities for learning. Inquiry is by nature an inclusive process (te Heesen, Siry and Wilmes, 2022), one which is inherent to young children's engagement in the world, and I elaborate this perspective in the following sections while reflecting on possibilities for working towards a truly inclusive early childhood science education.

A responsive and inclusive approach to science centers children's ways of knowing, thereby positioning children to engage and learn in their own unique ways. An inclusive science education builds from children's cultural and linguistic resources, their sense of wonder about the world, and their multiple and perceptive ways of investigating and sensemaking. The act of engaging in science is a relational, embodied, material, and open-ended practice, and providing children with opportunities for inquiry-oriented science engagement can create inclusive spaces. Young children draw on a wide range of resources in interaction within science learning spaces, including material, linguistic, gestural, emotional, cultural, and more, and it is important to provide children with opportunities to access these resources from which to build meanings with. Open-ended exploration, embedded in interaction and dialogue, can support children's embodiment, engagement and agency within science learning contexts and provide opportunity for children to pursue their wonderings. With that in mind, pedagogies that foster inquiry and dialogue can serve as inclusive and equity-oriented approaches, as these provide opportunities for children to draw on their resources in ways that are meaningful for them.

### ***Teacher Education is Critical for Inclusive Early Childhood Science***

Inclusion has to be seen as a never-ending search to find better ways of responding to diversity. It is about learning how to live with difference, and, learning how to learn from difference. (Ainscow, 2016)

A key to recognizing and valorizing diversity in ways that work towards inclusion and equity is for teachers to listen to and value young children's ideas and wonderings, and to that end, teacher education is a critical aspect of working towards an inclusive early childhood science education. Inclusive education begins with accepting and understanding children's differences and diversities in order to value, attend, and respond to these - whether academic, cognitive, cultural, emotional, physical, social, etc. Inclusion is a ongoing process, and inclusive approaches focus on accepting and understanding a range of student differences and diversities and providing structures to build from these. An inclusive science education pedagogy is dialogic, and an inclusive classroom context may look quite different in differing contexts, and thereby be challenging to describe or envision in general. An important component to inclusive education is the process of identifying and overcoming barriers to children's participation (Ainscow, 2016). This is a complex process, and it is critical that teachers have the education, professional development, resources and support needed to reflexively consider and evolve their practice with a view towards inclusion.

An inclusive education context is accommodating of diversity and difference, and thereby can create possibilities of learning for all students, and as such, inclusive education is primarily a social justice issue. In our work with teachers at the SciTeach Center we hope to emphasize the perspective that dialogic, inquiry-oriented science education is an inclusive, equity- and justice-oriented approach, and to that end we work with teachers towards resource-rich, anti-oppressive pedagogies with a goal of disrupting normalizing discourses that marginalize many of the children in Luxembourg's highly diverse classrooms. In my own practice I work towards what I have recently referred to as a pedagogy of plurality (Siry, in press), one which recognizes, highlights, and builds from difference, with a goal of learning how to *learn* from difference, as Ainscow's above quote suggests. Dialogue, participatory approaches and radical listening are critical to this process, and these can open up space for children and teachers to engage their imagination and to learn, do, and talk science. With a recognition of the value of differences, we can also conceptualize new possibilities for working

together towards shared goals and new learning opportunities. Key to this process is working with teachers to reexamine and reconsider their views on science and on the value of science for children, and in doing so to try to reimagine what could be the possibilities in classrooms for inclusive science education experiences.

A book such as this is an invitation to consider the perspectives of others, and to reflect on one's own. Hopefully these brief thoughts on an inclusive science education have provided an inspiration for you the reader to reflect on your perspectives on inclusive science education in the early years. Before delving into the chapters that follow, I encourage you to take a moment to consider the meanings, values and possibilities you ascribe to an inclusive science education, and after reading the monograph to consider contextualized connections that might emerge for you. Happy Reading. ☺

### **References**

- Ainscow, M. (2016). Diversity and equity: A global education challenge. *New Zealand Journal of Educational Studies*, 51, 143-155.
- Convention on the Rights of the Child (UNCRC). (1989). 1577 U.N. Treaty Series.
- Murdoch, D., English, A.R., Hintz, A. & Tyson, K. (2020). *Feeling heard: Inclusive education, transformative learning, and productive Struggle*. Educational Theory, 70: 653-679. DOI: 10.1111/edth.12449
- Rapp, A.C. & Corral-Granados, A. (2021). Understanding inclusive education – a theoretical contribution from system theory and the constructionist perspective, *International Journal of Inclusive Education*, DOI: 10.1080/13603116.2021.1946725
- Siry, C. (in press). *Teacher education as participatory practice: Learning to teach through collaboration and shared responsibility*. Springer publishers.
- te Heesen, Siry, C., & Wilmes, S. (2022). "Inquiry-based pedagogies as an inclusive practice: approaches for in-service teacher education". In K.N. Andersen, B.T. Ferreria da Silva, V. Silva de Moraes Novais [Eds.] *Educação, cultura e inclusão: Contextos internacionais e locais*. (p. 101-112). Appris Editora.
- UNESCO (2019). Cali commitment to equity and inclusion in education. Available at: <https://unesdoc.unesco.org/ark:/48223/pf0000370910.locale=en>