


Chapter 8

Fostering Science Learning for Deaf Children in Early Childhood

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ABSTRACT

Deaf children are natural born scientists. They explore their natural surroundings, build things, make sense of the world through their senses. Many Deaf children do not have such opportunities to build such background knowledge through social interaction and language before they arrive in early childhood programs due to lack of or limited language access. It is critical to provide unstructured and structured science learning activities where learners can develop critical thinking, problem-solving skills, and foster inquiry-based learning. This chapter will explore the elements of science pedagogy for Deaf children who use sign language in early childhood classrooms with an emphasis on four key areas: play and inquiry-based and hands-on learning approaches; using SL as a primary language of instruction; incorporating written language for literacy development in science; and visual/tactile aids and multimedia integration. In addition, a sample lesson plan for early childhood is included that is not an inherently “science” lesson but integrates scientific learning into the plan.

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INTRODUCTION

Deaf children are natural born scientists. They explore their natural surroundings, build things, make sense of the world through their senses. In doing so, they build background knowledge through sensorial experience, including physical experience. When they have social interactions with caregivers or community members who help guide their exploration and understanding using a language. Unfortunately, many Deaf children, especially those born to hearing families, do not have such opportunities to build such background knowledge through social interaction and language before they arrive in early childhood programs due to lack of or limited language access. In early childhood education, the foundations of scientific inquiry are exploration, observation, reflection, and discovery. It is critical to provide unstructured and structured science learning activities to Deaf children where they can develop critical thinking, problem-solving skills, and foster inquiry-based learning. This chapter will explore the elements of science pedagogy for Deaf children who use sign language in early childhood classrooms.

Research suggests that early exposure to science not only enhances children's curiosity and problem-solving skills but also contributes to their overall cognitive development (Gerde, Schachter, & Wasik, 2013). Deaf children need to have access to science content in a natural and accessible language, that is sign language (SL). This, in turn, supports their written literacy development. In doing so, they need to be taught through the integration of these two languages to develop a deeper understanding of scientific concepts and allow for effective communication of science ideas. A multilingual, multimodal approach has the potential to offer deaf learners access to science education in ways that align with their linguistic and communication strengths.

The chapter will discuss four areas of science education: play/inquiry-based learning approach which is learning through senses and scientific thinking, using SL as a primary language of instruction, incorporating written language for literacy development in science, visual/tactile aids and multimedia integration, and multiple cultural knowledge in science.

Early childhood education is a pivotal stage for fostering curiosity and foundational knowledge, and play is a powerful tool for engaging deaf learners. Deaf children need a dynamic environment that emphasizes play-based and inquiry-based learning approaches, combined with hands-on and mind-on activities, to learn scientific concepts and develop language skills. Before we discuss the four areas of science education, we want to discuss science content. What science content is usually covered in early childhood education? First of all, there are many phenomena that can be explored directly in the child's environment. We recognize that the environment varies school by school and home by home. As a teacher, you

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