

Chapter 8

Ants as an Experiential Learning Strategy in Preschool Teacher Training

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ABSTRACT

In this chapter, the authors present the results of a project designed for 41 preservice preschool teachers to introduce the concept of living things as an experiential learning strategy in the classroom. The need to approach this concept from a different perspective prompted the design of an education project involving the introduction of insects into classroom as a teaching resource. An informative storyline was used for project launch presentation. The questions they strive to answer in this chapter are related with what concepts of living organisms and what inquiry stages will preservice teachers consider their pupils will carry out during the project. Relevant concepts that are usually not much covered in the preschool curriculum such as the life cycles of animals were considered by 23 participants. Twenty-five of the future teachers claimed that they would be able to work on every inquiry step if they implemented this project in the classroom.

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INTRODUCTION

Inquiry, understood as the activity in which students develop knowledge and understanding about the scientific ideas and about how scientists study the natural world, is considered one of the central tenets in Science Education (National Research Council, 2012). This implies a shift from the stress on acquiring conceptual concepts to the importance of knowing how science is generated and validated, and the processes involved in it (Grandy & Duschl, 2007). To do so, teachers should be prepared with the knowledge and skills to encourage students to formulate questions, elaborate models, gather and analyze data, or evaluate alternative explanations. Pre-service preschool teachers (PPTs) successful professional development tasks need sufficient investment of time to enable teachers active learning and problem solving (Garet et al., 2001). Therefore, the role of the teacher switches from being the authority to become a guide in their students' learning process, preparing planned scaffolds to support it (Constantinou et al., 2018), and students are motivated to figure out the answer rather than waiting for it (Reiser, 2013).

However, as argued by several authors (Lucero et al., 2013; McDonald & Butler, 2008; Windschitl, 2003), teachers lack the necessary knowledge and skills to carry out science projects in classrooms. According to Forbes and David (2010), these problems are related to teachers' perceptions of how sciences are taught and learned. Other authors associate this problem with the limitations met by teachers during their training when designing a research activity. This means there is a need during teacher training for opportunities and support to practice these skills and change in their practice (Reiser 2013).

Therefore, in this chapter, we describe a project targeted at PPTs designed to introduce living things as a learning strategy in the classroom to promote students understanding of this content in Childhood Education and how science is constructed and validated. At early ages (3-6 years), living beings' concept can be a fascinating topic of inquiry-driven learning for children (Kim et al., 2018). Learning about living things raises awareness of science as a topic and introduces concepts such as how science is constructed including its contents, characteristics of living organisms, organs, and systems, and also what skills are needed, such as how to ask research questions, how to collect data, and attitudes towards science (Blackawton et al., 2011; Gerde et al., 2013).

The concept of living things in early learning stages has always been approached from a personal experience perspective, for example, a trail of ants seen one day in the park. These learning activities are valid in themselves, and useful strategies for understanding many other concepts, procedures, and attitudes of interest for scientific literacy. The need arises to enrich the field of children's experiences with the direct study of real organisms to physically approach the world of the most common organisms living around them (Prokop et al., 2008). Rearing insects in an educational setting positively affect improving the attitudes and beliefs of PPTs (Wagler & Wagler, 2011). Within the ample experience that young children have with the living organisms of their surroundings, relationships with vertebrates, especially mammals and birds, are the most frequent (Borgi & Cirulli, 2015; Wagler, 2010). Working on the topic of insects could serve to broaden the concept of what makes an animal and to include within this definition all invertebrates that seem far from our classic notion of an animal (Gálvez Esteban & Mellero-Alcibar, 2019).

Even though working with insects offers significant learning opportunities for students, education projects proposing their introduction in the classroom are limited (Wagler 2010; Timmerman & Ostertag, 2011) and mainly focused on emotions and interest about insects both in students (Borgi & Cirulli, 2015) as in teacher training (Gómez Prado et al., 2020; Wagler, 2011). This need arises prompted our design of an education project proposing the introduction of ants in the classroom as a teaching resource. Setting

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