

# Early Proportional Reasoning in the Context of Everyday Life: Cases of Japanese Lower-Grade Lessons in the Living Environment Studies

**Keiko Hino**

*Utsunomiya University, Japan*

**Hisae Kato**

*Hyogo University of Teacher Education, Japan*

**Mihoko Shiina**

*Kio University, Japan*

**Hiraku Ichikawa**

*Miyagi University of Education, Japan*

## **EXECUTIVE SUMMARY**

*This chapter focuses on the informal learning experience in the subject of “Living Environment Studies” (LES), which is a part of the lower-grade curriculum in Japan. This subject is positioned to foster children's independence and ability to enrich their lives. This chapter reports on an attempt to apply the children's experiences and learning in the LES classroom to the learning of mathematics. The mathematical ability targeted in this chapter is early proportional reasoning. Two cases of classroom practice are described and reported on the use of proportional reasoning by children to tackle measurement problems closely related to their daily lives. The*

*implications for the application of children's experiences and learning in life-focused lessons for the cultivation of early proportional reasoning are also discussed.*

## **LES (“SEIKATSU-KA”) AS A CONTEXT FOR INFORMAL LEARNING EXPERIENCE**

Informal learning has many definitions, related concepts, and controversial parts (Macia & Garcia, 2016). One such definition of informal learning, which is also considered in this chapter, is as follows: “learning from experience that takes place outside formally structured, institutionally sponsored, class-room based activities” (Watkins & Marsick, 1992, p. 288, cited by Macia & Garcia, 2016, p. 292). As emphasized in this book, informal learning experiences have the potential to support students’ learning and engagement in a formal learning environment by providing opportunities for them to make connections between textbook knowledge and real-world contexts. We also believe that informal learning experiences are significant because they are open to a variety of students with their own strengths in dealing with problems within the context. This book introduces various informal learning contexts. This chapter focuses on the contexts within schools that have strong connections to everyday life.

The contexts in this chapter come from a subject called LES (“Seikatsu-ka”). This is a subject of the Japanese curriculum in elementary schools. The goal of this subject is to “cultivate the qualities and abilities needed to become independent and enrich one's life through concrete activities and experiences, making use of views and ideas related to everyday life” (Ministry of Education, Culture, Sports, Science and Technology [MEXT], 2018a, p. 8). The emphasis is on children's creative acts through working directly with objects by looking, listening, touching, making, exploring, growing, playing, and so on and expressing what they notice through various methods such as words, pictures, actions, and dramatization (MEXT, 2018a, p. 10).

LES is offered in the first and second grades, and the objectives are the same for both grades. Through activities and experiences, it is intended to develop thinking and cognition typical of the early grades, thereby, connecting with early childhood education as well as with middle-grade subjects such as social studies and science. LES consists of nine content areas, including “health and safe living,” “contact with familiar people,” “attachment to the community,” “contact with nature,” “time and seasons,” “creative play,” and “joy for growth.” In this way, the fields of study include schools, homes, and community life. In addition, activities that should be experienced in early grades are included to enrich their lives, such as the use of public property, raising and cultivating plants and animals, and playing with nature and objects. This content is also connected to the recognition of personal growth in

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