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PUZZLING OVER SPATIAL REASONING: A PHENOMENOLOGICAL STUDY OF
PRE-SERVICE ELEMENTARY TEACHERS (269 pp.)

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The purpose of this study was to explore the essence of spatial reasoning in pre-service elementary teachers. An analysis of current research literature provided the definition of spatial reasoning used in this study: (a) graphically representing visual and spatial ideas; (b) representing three-dimensional objects on a two-dimensional surface and reconstructing three-dimensional models from a two-dimensional drawing; (c) seeing the relationships between parts and whole; (d) mentally rotating and manipulating an object or pictorially presented object; and (e) decomposing and redefining mentally held-objects even in the absence of relevant cues. Over thirty-seven hours of in-depth interviews were conducted with six pre-service elementary teachers in the spring semester, 2007, as they worked on spatial tasks addressing each component of the spatial reasoning definition. Phenomenological analysis of the data resulted in a model of spatial reasoning which included three main components: experience (childhood, school, and leisure); strategy (unitizing, patterning, and structuring); and representation (drawing and verbalizing). The core of spatial reasoning was found to be the ability to form and manipulate a mental image. This study showed that pre-service teachers would benefit from the opportunity to solve spatial puzzles in the classroom, reflect on their reasoning, and discuss their various strategies to build a repertoire of skills.