Chapter 2
The Epistemology of Young Children

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ABSTRACT

The purpose of this chapter is to raise questionable doubt about young children's abilities to engage in more sophisticated thinking; and the impact of technology on children's early epistemological development. The theoretical framework is rooted in Piaget's theories of cognitive development, and is typically applied to college students and adults. However, Piaget is criticized for seriously underestimating young children's cognitive ability. Moreover, scholars including Chandler, Hallet, and Sokol (2002) and Burr and Hofer (2002) have proposed an early predualist phase of epistemological development in which children between the ages of 3-to-6 may demonstrate more sophisticated ways of thinking and knowing related to theory of mind development. How does technology influence young children's beliefs about knowledge or how might teacher's and parent's beliefs about knowledge affect young children? This chapter explores the answer to this question by discussing the research on epistemology and young children in relation to cognition and cognitive development.

INTRODUCTION

In chapter 1 you read about the historical theories about knowledge and knowing. We discussed some of the relationships of knowledge to technology from the perspective of the teacher and how children process external stimuli. In this chapter I will discuss four areas of research: 1) the background information regarding cognition and cognitive development in terms of information processing theory and Bloom's Taxonomy; 2) children's personal epistemologies; 3) children and technology; and 4) teachers use of technol-

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ogy to support epistemological development in the classroom.

Piaget's Theoretical Framework

In the United States within the last half century, psychology as a discipline has made a major impact on the work of personal epistemology as we have experienced a paradigm shift from behaviorism to a cognitive perspective. In light of this paradigm shift, much of the focus in educational psychology has centered on Piaget's theory of development and constructivist instructional methods. Piaget has been one of the most influential researchers in the area of developmental psychology. He was primarily interested in the biological influences of how it is that we "come to know," or what he referred to as "genetic epistemology" (Piaget & Inhelder, 1969, p. 81). Piaget separated humans from other living creatures because of our ability to do "abstract symbolic reasoning" (Smith, 1993, p. 8). Piaget (1971) focused on four developmental factors related to an individual's cognitive functions: (a) biological factors, (b) equilibration factors, (c) social factors, and (d) education and cultural factors.

According to Piaget (1971), the process of development is carried out in a series of stages, each of which has a cognitive and logical form. He viewed developmental stages as being in a particular order because of the equilibration process (Kitchener, 1986). Piaget applied his stage theory and introduced four basic stages of cognitive development: (a) sensory motor, (b) pre-operational, (c) concrete operational, and (d) formal operational.

Piaget outlined several principles for building cognitive structures throughout his stages of cognitive development. Based on a child's experience and genetics, if an experience is familiar, they derive information and assimilate, whereby the information fits neatly into their existing cognitive map. However, if the information or the experience is unfamiliar or contradictory the child must accommodate their cognitive map, therefore adjusting their cognitive map to make the information correspond. The process of accommodation occurs, Piaget believed, because the cognitive structures lost equilibrium and required an equilibration process. For Piaget, this equilibration process is a constant attempt to adapt to the environment and construct stronger cognitive structures.

The goal of Piaget's genetic epistemology was to expand the theories of knowledge about cognitive development in children. He thought that children's logic and modes of thinking start out extremely different from adult cognitive processes. He viewed knowledge as a progressive construction, beginning with lower and less capable structures that develop into much stronger mechanisms as individual's progress through life (Flavell, 1983). Piaget assumed that there was a bond that existed between a child's biology and their environment; he called this function interactionism (Piaget, 1969).

The problem that arises in Piaget's stage theory is that children's development is driven precisely by the stage that they presently in. This means, if a child is in one stage, he cannot successfully master tasks in another stage. There have been substantial criticisms of Piaget's stage theory. There are questions that are raised about whether children really develop adhering to these criteria and also the argument that not all children reach formal operations (Driscoll, 1994). His work has been criticized for underestimating the ability of very young children and being overly optimistic about the capabilities of older children (Slavin, 2006).

Regardless, Piaget has been incredibly influential in the search to tap into children's cognitive understanding. In the 1960's, researchers focused on Piaget's ideas that children begin development with an egocentric subjectivity, meaning that they are incapable of understanding conceptual, perceptual, or affective perspectives (Flavell, 1983). In the 1970's, researchers focused on many of children's metacognitive abilities such as strategies,