Chapter 30
Multiple Perspectives for the Study of Teaching:
A Conceptual Framework for Characterizing and Accessing Science Teachers' Practical-Moral Knowledge

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ABSTRACT

This chapter outlines a framework that characterizes science teachers' practical-moral knowledge utilizing the Aristotelian concept of phronesis/practical wisdom. The meaning of phronesis is further explicated and its relevance to science education are outlined utilizing a virtue-based view of knowledge and practical hermeneutics. First, and to give a background, assumptions about teacher knowledge from a constructivist and sociocultural perspective are outlined. Second, the Aristotelian notion of phronesis (practical wisdom) is explicated, especially in terms of how it differs from other characterizations of practical knowledge in science education and how it relates to practical-moral knowledge. Finally, the authors discuss how the very nature of such practical-moral knowledge makes it ambiguous and hard to articulate, and therefore, a hermeneutic model that explores teachers' practical-moral knowledge indirectly by investigating teachers' commitments, interpretations, actions, and dialectic interactions is outlined. Implications for research and teacher education are outlined. Empirical examples are used to demonstrate certain points. A virtue-based view of knowledge is not meant to replace others, but as a means to enrich the understandings of the complexity of teacher knowledge and to enhance the effectiveness of teacher educators.

INTRODUCTION

Teachers (practitioners) often hold visions of 'good' teaching that differ from those of researchers, teacher educators, and reform documents (e.g., AAAS, 1990; NRC, 1996). Such disparity is a facet of the gap between theory and practice in education, and entails significant difficulties for research and reform efforts aimed at getting teachers to embrace and enact visions of 'good'

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teaching valued by researchers and teacher educators (Kennedy, 2006; Wildy & Wallace, 1995). Despite concerted efforts, closing this gap has been more elusive than initially imagined (Carr, 1995; Crawford, 2007), where substantial reform efforts in science education have met with limited success (Lynch, 2001; Smith & Southerland, 2007). We argue that a major reason for such limited success stems from educational research and reform that aims at changing teacher *actions* without ample understanding of underlying teacher knowledge.

Teacher actions have been the focus of research efforts since the early 1960s. Initially teacher actions were studied in an attempt to isolate 'effective' teaching techniques (process-product research) (e.g., Medley, 1979; Doyle, 1977; as cited in Issler, 1983; Woolfolk & Galloway, 1985). More recently, teacher actions (including language) have been scrutinized in the broader context of examining teacher knowledge and beliefs; and their influence on student learning, attitudes, skills, and classroom dynamics (e.g., Anderson & Mitchener, 1994; Borko & Putnam, 1996; Haney & McArthur, 2002; Moje, 1995; Mulholland & Wallace, 2008; Tsai, 2002). The latter focus on teacher knowledge, beliefs, and practices has uncovered yet further complexities of the gap between theory and practice. In science teaching, changing teachers' beliefs proved difficult (Smith & Southerland, 2007), and even when teachers held or shifted towards reform consistent-beliefs, dissonance often emerged between actual classroom practices and stated beliefs about teaching, learning, and nature of science (Bell, Lederman, Abd-El-Khalick, 2000; Simmons, et al., 1999; Southerland, Gess-Newsome, & Johnston, 2003). Evidently, translation of teacher beliefs and knowledge (specifically theoretical) into practice is more complex than initially perceived. Due to such complexity, the nature of teacher knowledge remains a rich area for exploration (Mulholland & Wallace, 2008).

PURPOSE

A broad aim of this chapter is to further elucidate a framework for understanding teaching practice as more than an arena for the application of theoretical knowledge and sets of skills (craft), but as a practice where teachers continuously engage a form of non-theoretical practical-moral knowledge. Acknowledging the role of non-theoretical knowledge in teaching has gained momentum in science education and several terms have been used to refer to it: practical knowledge (e.g., Duffee & Aikenhead, 1992; Fenstermacher, 1994; Lotter, Hardwood, & Bonner, 2007; Mulholland & Wallace, 2008; van Driel, Beijaard, & Verloop, 2001); practical-moral knowledge (Salloum & Abd-El-Khalick, 2010); and personal practical theories (Smith & Southerland, 2007). A complicating aspect of studying non-theoretical teacher knowledge though is elucidating and conceptualizing its character: Is it form of knowledge, reasoning, or an aspect of one's 'being' (e.g., Breire & Ralphs, 2009; Feldman, 2002)? Is a set of conceptions, skills, values, and beliefs that teachers develop with experience (e.g., van Driel, et al., 2001)? How can we study such knowledge? These issues have more practical importance than their esoteric nature suggests (Southerland, Sinatra, & Mathews, 2001), specifically since models promoted and utilized in educational research and teacher education are greatly influenced by conceptualizations of teacher knowledge and its nature.

In this chapter, teachers' practical-moral knowledge is characterized utilizing the Aristotelian concept of phronesis or practical wisdom (e.g., Breier & Ralphs, 2010; Clark, 2005; Flyvbjerg, 2001; Korthagen, & Kessels, 1999; Korthagen, Loughran, & Russel, 2006; Salloum & Abd-El-Khalick, 2010; Schwandt, 1996, 2005). However, as Breier and Ralphs (2010) stated, the concept of phronesis and practical wisdom is gaining popularity in education but not always clarity,