Inquiry, Nature of Science, and Evolution: The Need for a More Complex Pedagogical Content Knowledge in Science Teaching

Abstract

This qualitative study of the inquiry-based practices of twelve secondary science student teachers (interns) included: (a) their views of inquiry in science (b) their views of inquiry in science teaching and (c) their conceptions of facts, laws, and theories in science (or nature of science) (NOS). Interviews and writing pieces were used to determine views on inquiry and the nature of science. Data from classroom observations, daily lesson plans, and intern/cooperating teacher conversations were used to describe intern practice. Interns used inquiry mainly in the teaching of science concepts and principles. Eleven of twelve interns possessed similar views about the need to use inquiry in science teaching. These eleven interns used some form of inquiry in their classrooms at least twice a week for concept understanding. Only one of these eleven interns possessed adequate conceptions of the nature of science. Five interns viewed theory in science as partially being scientific belief that was not proven. These views appeared influenced by cultural and religious influences. Teaching strict inquiry, the nature of science, and important theories in science (like evolution) for scientific literacy appears at risk for all but one of these preservice teachers. Explicit teaching of science as a discipline, including scientific investigation and the NOS, is recommended immediately following the early stages of teaching and development of initial pedagogical content knowledge.