Public Abstract

First Name:Andrew

Middle Name:B

Last Name:West

Adviser's First Name:Mark

Adviser's Last Name:Volkmann

Co-Adviser's First Name:

Co-Adviser's Last Name:

Graduation Term:SP 2011

Department:Curriculum & Instruction

Degree:PhD

Title:The Development of Veteran 9th-Grade Physics Teachers Knowledge for Using Representations to Teach the Topics of Energy Transformation and Transfer

The purpose of this study was to explore and identify the experiences that informed the development of three veteran (experienced) 9th-grade physics teachers PCK for using representations to teach the topics of energy transformation and transfer. The primary sources of data were observations of an entire unit of instruction on energy and a series of four stimulated-recall interviews throughout the unit of instruction. The results of the phenomenographic analysis revealed that nine categories of experiences informed the development of the three participants PCK for using representations to teach the energy topics. The categories included: 1) teaching experience, 2) Physics First PD, 3) other school district-supported PD, 4) collaboration with current colleagues, 5) past collaboration with experienced teachers, 6) academic experiences as a learner of science, 7) school district expectations, 8) collaboration with university faculty/other PD, and 9) non-academic life experiences. The analysis also revealed that as a result of engaging in the nine experiences, the participants developed more integrated PCK for using representations in their instruction. The results of the study highlight that the development of PCK for using representations is best supported through a combination of reflection on teaching experience, collaboration with colleagues, and professional development that provides topic-specific instruction in terms of content and pedagogy. Implications for pre-service teacher education and in-service PD are provided.