

Development of a Grade Eight Taiwanese Physical Science Teacher's
Pedagogical Content Knowledge Development
一位初任臺灣國二理化教師學科教學知識之發展研究

Tuan, Hsiao-Lin; Kaou, Rong-Chen

Abstract

The purposes of this study were to examine a beginning Taiwanese female science teacher's physical science teaching, and how her science teaching developed from her senior year to her first semester of classroom teaching. Both microscopic and macroscopic pedagogical content knowledge (PCK) were implemented in the investigation. A qualitative research method was applied. The research was conducted from Shu-May's senior year to the first semester of her beginning year. The findings revealed that the nature of Shu-May's PCK consisted of instructional strategies and representation. Her instructional strategies were characterized by the verification method of introducing science concepts. Her instructional representation included linguistic expressions, calculation problems, demonstration, daily-life experiences and relevant examples via verbal and visual display. Shu-May's PCK development revealed integration, relevance, and specificity features. Shu-May's knowledge of her students changed from a general view of student learning to a more specific understanding of their content learning ability. Her content knowledge also changed from a general view of the physical science discipline to specific knowledge of what students should know about each topic. Factors influencing Shu-May's PCK development were her perceptions of science teaching and students' science learning, her insensitivity in both judging students' level of understanding and deciding on appropriate goals for the lessons, her declining retention of pedagogical knowledge learned in teacher education programs, and the different cultural norms she perceived in different teaching contexts.

Key words : Pedagogical content knowledge; Beginning science teachers;
Teacher's professional development; Physical sciences; Junior high schools

中文摘要

本研究的目的是在檢驗一位初任女教師在大四至大五上學期期間，其理化的教學特質與成長。研究的理論架構採微觀與巨觀的學科教學知識。研究方法採質的研究。資料收集包含教室觀察、晤談與文件收集。研究進行期間，由個案質淑美的大四教材教法與實習課，至大五上學期期末止。資料分析主要採分析歸納法。研究發現顯示，淑美的學科教學知識特質包涵教學策略與教學表徵兩部份。她的教學策略主要採用驗證式的方式教授科學概念。淑美教學表徵包涵，口語表達、解題演練、示範、生活實例、利用口語與圖示等方式。淑美的學科教學知識發展呈現出統整、關聯、與具體的特徵。在研究結束時她的教學思考已經能同時整合學科、教學、與學生。在教年中她試圖將學科知識與學生的理解做關連。雖然她企圖使用不同的表徵使得學生能理解概念，但這些表徵未必能符合學生的理解程度。她的學科知識亦從對理化科課程一般的看法，到學生在每單元大致而瞭解到的目標。最後，影響淑美科學教學知識發展之因素，包括其對科學教學與對學生的知覺，她對於檢驗學生的理解程度與合宜的課程目標不夠敏銳，她本身對教學知識的淡忘，和在不同的教學文化情境中所造成的教學重心差異。文章最後亦對於未來科學師資培育做一建議。

關鍵字：臺灣；國中；理化教師；學科；教學知識