Chapter 67
Evaluation of a Hybrid Mathematics Methods Course for Novice Teachers

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ABSTRACT
This paper reports the evaluation of a hybrid mathematics methods course for novice teachers. During a fifteen-week semester, participants met face-to-face for approximately 60% of the semester and took advantage of an online format for the other 40% of the semester. Online activities included asynchronous discussion board postings, synchronous chats as an entire class, synchronous chats in small groups, evaluation of technology tools, and electronic surveys. The researcher used participants’ feedback to evaluate the effectiveness of this hybrid format. In addition, the researcher reflected upon his own experiences as instructor to inform future course structure decisions. Within the context of the Rich Environments for Active Learning (REAL) framework, results suggest that cooperative support was a key component of the effectiveness of the experience. Further, participants emphasized one particular generative learning activity as an effective component of this course. Finally, this paper discusses implications for mathematics professional development facilitators.

INTRODUCTION
Online learning affords students new opportunities for learning. A few of its many advantages include the ability to work at one’s own pace, the availability of communities of practice across the globe, and the practicality of less commutation time between home and a physical campus. However, online learning is not as simple as taking an existing face-to-face course and supplanting it onto a technological medium. Rather, as Vonderwell and Turner (2005) noted, “Online teaching requires a redesign of student and instructor roles, responsibilities, and commitments” (p. 68). The social climate of an online classroom is not necessarily the same as a face-to-face classroom, and both student and instructor must be aware of this. How, then, can online learning be positioned to best support the needs of in-service elementary teachers, particularly within the context of
mathematics methods courses? The present study sought to address this question. Student achievement and teacher quality have been correlated within the research (Darling-Hammond, 2000). To improve teacher quality, one must attend to the experiences of teachers within the context of the courses they take. The present study specifically sought to identify those experiences and activities, completed online, which novice teachers found to be most effective.

What, then, are the elements of effective mathematics teacher education? The answer to this question does not necessarily depend on the medium – whether face-to-face, online, or hybrid formats. Rather, the answer depends on what the research says about effective methods courses and professional development experiences. Specifically, Gadanidis and Hoogland (2002) identified four components of effective mathematics teacher education, based on their review of the literature. These include:

- Aesthetic experiences with mathematics;
- Confronting personal beliefs about mathematics;
- Engaging in practical inquiry;
- Discussing pedagogical implications in the context of mathematics education literature (Gadanidis & Hoogland, 2002, p. 2).

**Theoretical Framework**

Multiple names for and definitions of information and communications technology-enhanced (ICT) learning exist in the literature. For example, Kirkwood (2009) notes the following terms for learning which is supported by ICT: computer-assisted learning, e-learning, networked learning, online learning, telelearning, and technology-enhanced learning. Hybrid learning, therefore, would include any of these ICT-enhanced formats, as well as face-to-face classroom interaction. Singer (2008), for example, offers one definition for hybrid models of professional development: “In a hybrid model, a local facilitator provides face-to-face instruction, while teachers continue to work on the course materials online” (p. 208). This would perhaps suggest that teachers are working independently on course materials through an electronic format. The present study did include some experiences