

Chapter 67

Evaluation of a Hybrid Mathematics Methods Course for Novice Teachers

Christopher J. Johnston
American Institutes for Research, USA

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).

Brief Review of the Literature

As noted by Alexander, Lignugaris/Kraft, and Forbush (2007), the literature is replete with studies examining participants' perceptions of online courses, as well as comparisons of online formats to traditional face-to-face courses. However, of the ten studies identified by these researchers, none focused on learners' perceptions of hybrid mathematics methods courses. Further, a search of the literature by this author resulted in a limited number of studies which explicitly examined

online or hybrid mathematics methods courses, whether for pre-service or in-service teachers, or both.

As a result, an analysis of such studies reveals the potential for online professional development experiences for teachers of mathematics. Groth and Burgess (2009) explored two different online approaches for in-service mathematics teachers. Rather than focusing on learners' perceptions of the two approaches, their analysis targeted the types of discourse which emerged from the experiences. Russell, Carely, Kleiman, and Venable (2009) examined participants in both online and face-to-face formats, and they found that participants in the online experience were more willing to take courses if they were offered in an online format. Cady and Rearden (2009) developed a series of online professional development courses to meet the needs of rural educators. Their results suggest that the design of the courses encouraged communities of practice among the participants.

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

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