Chapter 15
Pre-Service Elementary Teachers' Evaluations of Technology Tools for Mathematical Learning:
A Reflective Model

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ABSTRACT

Pre-service elementary teachers are faced with numerous technology tools which can be incorporated into their mathematics lesson plans. However, these teachers may not be experienced in evaluating technology tools for mathematical learning prior to using them. This chapter presents a reflective model for mathematics teacher educators. In a three-part activity, pre-service elementary teachers identify their criteria for evaluating technology tools, evaluate several technology tools according to their own criteria, and make recommendations for or against those technology tools. As pre-service elementary teachers reflect upon the criteria they feel are essential for evaluating technology tools, they begin to identify the specific affordances and limitations of the technology tools. This chapter describes this three-part activity by placing it within the context of a model for mathematics teacher education.

INTRODUCTION

Pre-service elementary teachers have a wealth of technology tools available to them for use in mathematics instruction. However, the ways in which pre-service elementary teachers use technology depend upon their own personal beliefs and exposure to technology tools in their methods courses. Pre-service elementary teachers need to become good consumers of the technology resources available to them. This chapter offers mathematics teacher educators a framework for developing pre-service elementary teachers' skills in evaluating technology tools for mathematical learning. Research indicates that pre-service elementary teachers who evaluate technology tools and consider their unique affordances begin to focus on student learning when designing their own lessons. This chapter has been designed to assist mathematics teacher educators

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who choose to incorporate reflective activities for their pre-service elementary teachers in the context of evaluating technology tools.

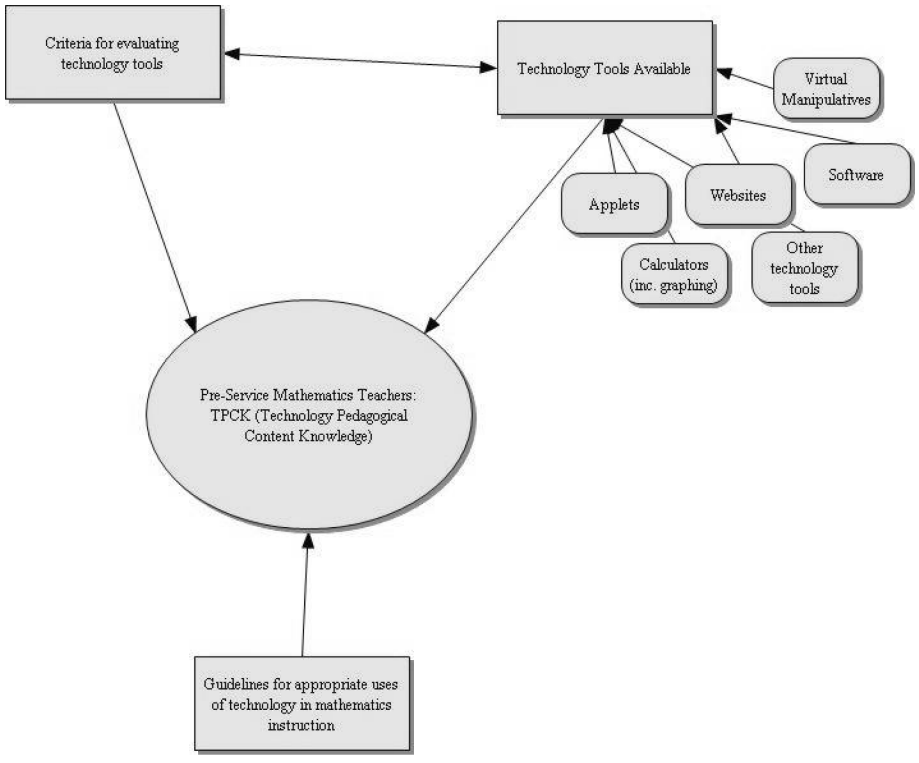
This chapter is the result of work done by the author with a group of pre-service elementary teachers during a required semester-long mathematics methods course. The author has developed an activity for pre-service elementary teachers in which they evaluate technology tools for mathematical learning. In the process of evaluating technology tools, pre-service elementary teachers consider their criteria for evaluation and reflect upon the specific affordances and limitations of the technology tools.

The conceptual framework guiding this chapter is displayed in Figure 1. Note that the center of the framework corresponds to one goal of mathematics teacher education, which is to develop teachers' Technology, Pedagogy, And Content Knowledge (TPACK). TPACK for mathematics is defined as: "the intersection of the knowledge of mathematics with the knowledge of technology with the knowledge of teaching and learning" (Niess, Lee, Sadri, & Suharwoto, 2006, p.1). In other words, TPACK is knowing how to teach mathematics when technology is integrated into the curriculum.

Surrounding the center of the conceptual framework are three major elements of a technology-enriched pre-service elementary math methods course, which will be discussed in this chapter: Technology Tools Available, Guidelines for Appropriate Uses of Technology in Mathematics Education, and Criteria for Evaluating Technology Tools. The author maintains that these three elements should be in place in methods coursework before pre-service elementary teachers begin creating lesson plans for mathematics which incorporate the use of technology.

Specifically, the objectives of this chapter are as follows. This chapter will:

Figure 1. Author's conceptual framework



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