Chapter 24
Digitally Capturing Student Thinking for Self-Assessment:
Mathcasts as a Window on Student Thinking during Mathematical Problem Solving

Sheri Vasinda
Texas A&M University-Commerce, USA

Julie McLeod
University of North Texas, USA

EXECUTIVE SUMMARY

The continuing improvements and access to digital technology provide opportunities for capturing student thinking never considered or available in the past. Knowing the importance of thinking processes and understanding children's resistance to writing them down, mathcasts were used as a way of supporting students during their problem solving. Mathcasts are screencaptures of students' work and thinking as they write and talk about their thinking during mathematical problem solving. Viewers of the mathcast gain unique insight into the students' problem solving process, thinking process, and mathematical conceptions or misconceptions. The authors found screencasts to be a good technological match with mathematical problem solving that provided a more powerful opportunity for both self-assessment and teacher assessment that was not available with traditional paper and pencil

DOI: 10.4018/978-1-61350-492-5.ch024

reflection. When students can revisit their verbal thinking several times throughout the year, they are equipped to self-assess in new, powerful and more reflective ways.

BACKGROUND INFORMATION

Powerful Technology and Strategy Matching

While exploring the possibilities and influences that technology has on education, our work has involved matching traditionally strong, evidence-based teaching or learning strategies with a complementary technology application and examining the possibilities these pairings afford. We have followed Kozma's (1991) lead by selecting technology that is uniquely suited to the learning project at hand while maintaining the integrity of the original learning strategy. While exploring portfolio learning paired with podcasted reflections and digital scans of learning artifacts (McLeod and Vasinda, 2009), Language Experience Approach with wiki's and blogs (Vasinda, McLeod & Morrison, 2007), and Readers Theater paired with podcasting (Vasinda & McLeod, in press), we have discovered that the multidimensional nature of these technological pairings have afforded new opportunities for learning by both teachers, students, parents and other stakeholders. In this case we will describe our latest pairing: screencasting with UPS-Check, a four-step mathematical problem solving process. We refer to this new paring as "mathcasts" an idea first used by Tim Fahlberg (Fahlberg, Fahlberg-Stojanovska, & MacNeil, 2006; Fahlberg-Stojanovska, Fahlberg, & King, 2008). (To view mathcasts, navigate to http://math247.pbwiki.com/). When considering a powerful technology and assessment strategy match, our first consideration is maintaining the integrity of the learning strategy while also creating something that was not there without the technology. In other words, we believe it is important to maintain the elements of any strategy that have proven effective through research and practice, whether a literacy strategy, problem solving strategies or those involving students in self-assessment. Then, we look for technology affordances that highlight the strategy strengths while adding a dimension that was not possible without the technology so that the combination creates positive changes in the learning environment that were not possible without this pairing (McLeod & Vasinda, 2009b).

Setting the Stage

The problem for this case was students' resistance to showing their thinking, or work, for math word problems. One of the ways to assess problem-solving is through analyzing students' written response to the word problem. Even when students do