

The Power of Professional Development and Self-Efficacy in the Teaching of Mathematics



Summary

SRA Number Worlds professional development is built around five guiding principles of effective professional learning: content-specific, active engagement, teaching models, collaborative learning, and applied practice. Professional development activities in the program offer materials and promote proven features that result in effective professional development activities.

Professional Development

Successful teachers in any content area are committed to being part of a community of educators and continuously evaluate their performance, actively pursuing discussions and professional development activities to increase their abilities to successfully push student achievement (NCTM, 2000). This self-efficacy leads to a greater commitment of teachers (Ross & Gray, 2006), resulting in teachers who are more proactive in seeking opportunities to grow professionally (Greisjel, Slegers, Stoel, & Kruger, 2009).

The well-documented and considerable gap in mathematics achievement between English Language Learners (ELLs) and their non-ELL peers (NCES, 2010) illustrates the power of professional development and self-efficacy in the teaching of mathematics. Even when teachers have demonstrated successful mathematics teaching ability, they have been found to show decreased confidence and success teaching ELLs. Research has shown that participation in professional development increases self-efficacy, and positions professional development as having high potential for increasing overall mathematics scores in schools (Ross, 2013).

Five Guiding Principles

SRA Number Worlds offers professional development that is tied to research on the most effective professional development practices in use today. Number Worlds professional development is designed around five guiding principles of effective professional learning: Content-Specific, Active Engagement, Teaching Models, Collaboration, and Applied Practice.

1. Content-Specific

Too often professional development offerings are general in nature, and do not provide grade and content differentiation. This type of professional development is too broad to be useful to the classroom teacher. Focusing on the learning and teaching strategies proven to be effective in the discipline helps teachers make connections between research and classroom practice. Discipline-specific professional development is not only shown to be more effective in improving student learning (Blank, de las Alas, & Smith, 2007; Cohen & Hill, 2001), it is also a top priority for teachers (Darling-Hammond, Chung Wei, Andree, Richardson, & Orphanos, 2009).

In SRA Number Worlds, professional development focuses heavily on preparing teachers to build their understanding and application of the Common Core State Standards, including the Standards for Mathematical Practice. In addition, professional development offerings feature resources targeted at two cornerstones of the Number Worlds curriculum: the development of number sense in younger children and the leveraging of learning trajectories. By concentrating professional development in these areas, Number Worlds professional development takes advantage of the proven benefits of content-specific professional development (Bausmith & Barry, 2011).

2. Active Engagement

Both online and onsite professional development can be a passive activity with limited interaction and engagement. We know that this represents a faulty premise about how adults learn. McGraw-Hill Education learning experiences are designed to actively engage teachers in their professional learning. Through reading and responding, developing learning tools and lessons, and collaborating with peers, teachers will become active participants in their own professional growth.

Opportunities for self-reflection are built directly into SRA Number Worlds, encouraging an ongoing learning experience (Desimone, 2009). SRA Number Worlds includes embedded Teacher Edition features, such as Teacher Reflect evaluation criteria in the Project-Based Learning activities, encouraging educators to continually review and hone the ways in which students respond to directions, questions, and reflection prompts. Teachers have the opportunity to view models of lessons and concepts being taught in the Implementation Course, as well as to extend their understating by tapping into the learning network provided by the discussion boards in the course. The goal is to support teachers as they work to become program and math intervention experts.

3. Teaching Models

Expert demonstrations of new practices are a particularly engaging, and successful, mode of learning for teachers (Cohen & Hill, 2001; Penuel, Fishman, Yamaguchi, & Gallagher, 2007; Snow-Renner & Lauer, 2005). McGraw-Hill Education incorporates videos of authentic classroom practices using real teachers in real classrooms into all of its professional development.

SRA Number Worlds professional development resources include videos that show the Number Worlds program in action. In this video library, Number Worlds teachers and authors explain the program philosophy and model best-practices for teaching math effectively.

4. Collaborative Learning

Professional Learning Communities have taken hold in schools because they allow teachers to act as true professionals by working with peers to model tasks, discuss research, and share instructional ideas. Research confirms that effective professional development incorporates elements of collaboration (Biancarosa, Bryk, & Dexter, 2010). Teachers can take their collaboration online with McGraw-Hill Education.

In conjunction with its online Implementation Course, SRA Number Worlds provides a discussion board for prevention and intervention teachers to learn and grow together as they work with students (Buysse, Sparkman, & Wesley, 2003). Discussion topics provided for each course module serve as starting points for teachers to engage in online conversations about a variety of educational topics, including program implementation, technology usage, the Common Core State Standards, and administration of assessments.

5. Practical Application

To transfer learning into practice, a strategy needs to be practiced at least 20 times (Joyce & Showers, 2002). McGraw-Hill Education supports practical application of learning in a variety of ways. Activities are designed to incrementally introduce change into practice by providing opportunities for teachers to learn about new strategies and instructional practices, apply their knowledge, reflect on results, and collaborate with colleagues throughout the process.

One way in which SRA Number Worlds promotes practical application is with McGraw-Hill Education's Standards for Mathematical Practice in Action video series and companion viewing guides, which are included in its online Implementation Course. Teachers can watch classroom-based examples of the Common Core Mathematical Practices being employed in K-2, 3-5, and 6-8 classrooms and then apply strategies learned in their own classrooms. Each companion viewing guide provides a vehicle for colleagues to reflect on grade-band specific strategies viewed in the videos and share results experienced with their own students.

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