Chapter 4

The Use of Instructional Coaching and Analogy to Enhance STREAM Professional Development for Teacher Quality Improvement

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ABSTRACT

The design, implementation, and continuous improvement of professional development (PD) is a key component to address inherent challenges in helping our urban schools achieve their full potential for STREAM (STEM with integrated reading and arts) learning. While there are many types of PD, instructional coaching is one of the most promising strategies that can address both teacher and student needs on multiple levels. The DC FUSION STREAM PD Consortium was formed in 2017 with initial seed funding from the US Department of Education's Teacher Quality Improvement Grant Program. In this chapter, key aspects of the DC FUSION STREAM PD Consortium are described in the context of analogies for enhanced STREAM PD and how a broader view and implementation of instructional coaching can be used to transform teacher practice and effectiveness and elevate student achievement.

INTRODUCTION

Washington, DC is a rapidly expanding city that hosts many large-scale construction and renovation projects that are in various stages of completion. While these visible changes help to improve the physical infrastructure of DC, there are several important efforts that focus on improving the very important educational and learning infrastructures in DC. The similarities between construction, renovation projects, and education reform can be used to build analogies and provide insight to address the challenges that are encountered in K-12 STREAM Education in DC where STREAM refers to STEM enriched with reading and arts. Analogies are powerful learning tools (Pollack, 2015; Vendetti et al., 2015) that can help foster a deeper understanding of complex phenomena by linking simple concepts and images together in creative ways to help learners make sense of abstract concepts. The human brain is hardwired to learn from experience. As such, the mental models that develop with analogies can empower learners to more effectively take simple concepts and assemble them into elegant ideas to solve real world problems (National Research Council, 2000; Matlen et al., 2011; Nature Photonics Editorial, 2014). Boaler (2016) discusses brain research as it relates to comprehending mathematics. Moreover, this building block approach that combines brain research and analogies can help teachers design engaging experiences in STREAM learning environments.

School reform efforts often include teacher professional development (PD) as a means for improving schools and impacting student achievement. Professional development is a key framework component for achieving goals related to improved teacher practice and student learning outcomes. There are a variety of ways to present professional development. Some of the more common PD approaches include content specific workshops, full-day professional development sessions, peer mentoring, coaching, and blended professional development that consists of independent workshops and coaching or peer-mentoring. Joyce and Showers (2002) identified four training concepts that are very important components in instructional coaching: Knowledge, Modeling, Practice of the Skill Set, and Peer Coaching. Inclusion of these concepts within professional development interventions allows educators to engage in the presented content in a more meaningful way. The authors suggest that teachers should engage in practicing the newly learned skill, concept or strategy for 8-10 weeks or for about 25 trials to improve retention (Joyce and Showers, 2002). As mentioned in the above construction analogy, there must be an organized structural approach to implementing professional development that will

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