Chapter 10
Homeland Security Information Technology and Engineering (ITE) Professional Development Training for Educators in Urban High Schools

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ABSTRACT

This chapter focuses on an Information Technology and Engineering (ITE) professional development training project designed to increase the number of teachers in an urban school district with proficient skills, tools, and content knowledge in computer/information technology, engineering technology, and technical certifications that will support students in Science, Technology, Engineering, and Mathematics (STEM) fields. Through this process, high school teachers will use tools, resources, and training to understand homeland security issues and career opportunities for students in their schools. A cohort of STEM teachers from an urban school district located in Baltimore City participated in a professional development workshop that included information technology, engineering, and homeland defense education to support students pursuing technical careers in these areas. The training addressed deficiencies in content knowledge of homeland security issues and research linked to the high school STEM curriculum homeland security career opportunities available to high school students. The overall goal of the ITE profession development training was designed to increase the technical proficiency of STEM teachers in urban high schools serving historically underserved students to support students in Information Technology (IT), engineering, and homeland security careers, thus nurturing a homeland security science and engineering workforce.

SETTING THE STAGE

Today's students require educators who understand and know how to use technology in the classroom. Local Urban Public Schools are committed to graduate all students with the necessary science, technology, engineering, and mathematics (STEM) competencies that are needed to become part of the global work force of problem solvers and innovators, (Maryland State Department of Education, 2001). The National Strategy for Homeland Security support information systems contributions to the country's national defense. It is imperative that present and future educators learn to use information technology and systems in its most advanced capacity to adequately support the homeland security mission.

The use of instructional technologies as applied to homeland security applications in the classroom will cultivate key components of student learning that include active engagement, participation in group discussions, frequent interactions, feedback, and connections to real-world applications. Instructional technology through the use of computers and the Internet have changed the world rapidly and irreversibly (Gardner, 1993). Our society is in transition from an industrial economy to an information economy and these paradigm shifts will have an impact on the way individuals live, work and educate students.

CASE DESCRIPTION

During the first week, the teachers were given an introduction to Homeland Security, 21st Century Skills and project base learning, (Hmleo-Silver, Duncan, & Chinn, 2007). Teachers were awarded an opportunity to interact with various professionals in the Homeland Security industry and learn insightful methods of implementing elements of Homeland Security into their existing curriculum. Teachers were also granted an opportunity to visit the Cryptologic Museum and furthermore

expand their knowledge on yet another Homeland Security topic. Finally, teachers began to work on developing project base curriculum that infused Homeland Security topics, projects and elements (Powers & DeWaters, 2004).

Instructional Technology Linked to Homeland Security and the STEM Curriculum

Instructional technology as applied to homeland security and the state Voluntary State Curriculum (VSC) in science, mathematics and technology education applications in the classroom is linked in the following ways (Maryland High School Assessments, 2009):

- Students are motivated, engaged and learning actively based on real word applications;
- Collaborative student learning is authentic;
- Instruction and learning can be integrated across curriculum;
- Assessments are performance based;
- Effective technology integration is achieved through teacher professional development in technology making it routine and transparent in the classroom in order to support curricular goals;
- Instructional technology tools enable students to be intellectually challenged while providing a realistic outlook of homeland security technologies;
- Students acquire and refine their analysis and problem-solving skills as they work individually and in teams to find, process, and synthesize information;
- Podcasting connects students and teachers with world experts and provide numerous opportunities for expressing understanding through images, sound and text;
- Visualization and modeling tools offer students ways to experiment, observe phe-

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