Web 2.0 Tools and its Effect on Math Instruction and Achievement

Stuart Ogburn

Kennesaw State University

**Setting/Context**

Norton Park Elementary School is a Title I school located in Smyrna, Georgia. Located within the Cobb County School District, over 90% of students receive a free or reduced lunch. With over 900 students, the population is mostly African American and Hispanic while a small percentage is made up of Caucasian and Asian students.

The school has several technologies available to students and teachers including 4 class sets of iPads and two class sets of netbooks. Additionally, four classroom teachers have their own class set of iPads. The school has also been a Bring Your Own Technology School for several years. The school is continuously acquiring new technologies and is even up for a technology retrofit next year.

**Capstone Problem and Rationale**

Integrating technology into the classroom has proven to effect student achievement and engagement. When preparing students to become college and career ready as well as prepared with 21st century skills technology plays a very important role. However, with all the new technologies within Norton Park there is little professional development for teacher when it comes to using these technologies. Teachers need more support in order to increase student achievement.

**Objectives/Deliverables:**

* Create a professional development plan to introduce key Web 2.0 tools that directly support math instruction.
* Implement personalized professional developments for teachers by modeling and providing individual support.
* Improve teachers understanding about technology standards and technology integration
* Conduct a pre and post survey with teachers and a pre and post test with students.

**PSC Standards**

**1. Visionary Leadership**

Candidates demonstrate the knowledge, skills, and dispositions to inspire and lead the development and implementation of a shared vision for the effective use of technology to promote excellence and support transformational change throughout the organization.

* **1.1 Shared Vision**

Candidates facilitate the development and implementation of a shared vision for the use of technology in teaching, learning, and leadership.

* **1.2 Strategic Planning**

Candidates facilitate the design, development, implementation, communication, and evaluation of technology-infused strategic plans.

* **1.3 Policies, Procedures, Programs & Funding**

Candidates research, recommend, and implement policies, procedures, programs, and funding strategies to support implementation of the shared vision represented in the school, district, state, and federal technology plans and guidelines. Funding strategies may include the development, submission, and evaluation of formal grant proposals.

* **1.4 Diffusion of Innovations & Change**

Candidates research, recommend, and implement strategies for initiating and sustaining technology innovations and for managing the change process in schools.

**2. Teaching, Learning, & Assessment**Candidates demonstrate the knowledge, skills, and dispositions to effectively integrate technology into their own teaching practice and to collaboratively plan with and assist other educators in utilizing technology to improve teaching, learning, and assessment.

* **2.1 Content Standards & Student Technology Standards**Candidates model and facilitate the design and implementation of technology-enhanced learning experiences aligned with student content standards and student technology standards.
* **2.2 Research-Based Learner-Centered Strategies**  
  Candidates model and facilitate the use of research-based, learner-centered strategies addressing the diversity of all students.
* **2.3 Authentic Learning**  
  Candidates model and facilitate the use of digital tools and resources to engage students in authentic learning experiences.
* **2.4  Higher Order Thinking Skills**  
  Candidates model and facilitate the effective use of digital tools and resources to support and enhance higher order thinking skills (e.g., analyze, evaluate, and create); processes (e.g., problem-solving, decision-making); and mental habits of mind (e.g., critical thinking, creative thinking, metacognition, self-regulation, and reflection).
* **2.5 Differentiation**  
  Candidates model and facilitate the design and implementation of technology-enhanced learning experiences making appropriate use of differentiation, including adjusting content, process, product, and learning environment based upon an analysis of learner characteristics, including readiness levels, interests, and personal goals.
* **2.6 Instructional Design**  
  Candidates model and facilitate the effective use of research-based best practices in instructional design when designing and developing digital tools, resources, and technology-enhanced learning experiences.

**3. Digital Learning Environments**  
Candidates demonstrate the knowledge, skills, and dispositions to create, support, and manage effective digital learning environments.

* **3.1 Classroom Management & Collaborative Learning**

Candidates model and facilitate effective classroom management and collaborative learning strategies to maximize teacher and student use of digital tools and resources.

* **3.6 Selecting and Evaluating Digital Tools & Resources**

Candidates collaborate with teachers and administrators to select and evaluate digital tools and resources for accuracy, suitability, and compatibility with the school technology infrastructure.

* **3.7 Communication & Collaboration**

Candidates utilize digital communication and collaboration tools to communicate locally and globally with students, parents, peers, and the larger community.

**4.  Digital Citizenship & Responsibility**

Candidates demonstrate the knowledge, skills, and dispositions to model and promote digital citizenship and responsibility.

* **4.1 Digital Equity**

Candidates model and promote strategies for achieving equitable access to digital tools and resources and technology-related best practices for all students and teachers.

* **4.2 Safe, Healthy, Legal & Ethical Use**

Candidates model and facilitate the safe, healthy, legal, and ethical uses of digital information and technologies.

**5. Professional Learning & Program Evaluation**  
Candidates demonstrate the knowledge, skills, and dispositions to conduct needs assessments, develop technology-based professional learning programs, and design and implement regular and rigorous program evaluations to assess effectiveness and impact on student learning.

* **5.1 Needs Assessment**

Candidates conduct needs assessments to determine school-wide, faculty, grade- level, and subject area strengths and weaknesses to inform the content and delivery of technology-based professional learning programs.  **5.2 Professional Learning**

Candidates develop and implement technology-based professional learning that aligns to state and national professional learning standards, integrates technology to support face-to-face and online components, models principles of adult learning, and promotes best practices in teaching, learning, and assessment.

* **5.3 Program Evaluation**

Candidates design and implement program evaluations to determine the overall effectiveness of professional learning on deepening teacher content knowledge, improving teacher pedagogical skills and/or increasing student learning.

**6. Candidate Professional Growth & Development**

Candidates demonstrate the knowledge, skills, and dispositions to engage in continuous learning, reflect on professional practice, and engage in appropriate field experiences.

* **6.1 Continuous Learning**

Candidates demonstrate continual growth in knowledge and skills of current and emerging technologies and apply them to improve personal productivity and professional practice.

* **6.2 Reflection**

Candidates regularly evaluate and reflect on their professional practice and dispositions to improve and strengthen their ability to effectively model and facilitate technology-enhanced learning experiences.

* **6.3 Field Experiences**

Candidates engage in appropriate field experiences to synthesize and apply the content and professional knowledge, skills, and dispositions identified in these standards.

**Project Description**

This capstone project will begin at the start of the next school year. The purpose is to instruct teachers on how to use Web 2.0 tools to increase student achievement and engagement in math. Teachers will also be instructed on how to use Web 2.0 tools in order to create authentic lessons and to help student reach the higher-level orders of thinking. By implementing small group and one-on-one professional learning sessions teachers will learn the necessary skills it takes to integrate Web 2.0 tools into their classroom. Teachers will also learn how to differentiate and remediate instruction by using technology and Web 2.0 tools. Only willing teachers will participate in this project as it will not be a requirement for the staff.

**Evaluation Plan**

Teachers and students will be evaluated throughout this project on the effectiveness that web 2.0 tools have on math achievement and engagement as well as how comfortable teachers are using these tools. Teachers will be evaluated through informal observations and discussions as well as a pre and post survey to evaluate the effectiveness of the professional development. Student success will also be evaluated by conducing a pre and posttest in order to measure the effects of web 2.0 tools on student achievement. Students will also take a pre and post survey to determine how well they like or dislike using Web 2.0 tools to learn.