Capstone Proposal:

Using Instructional Strategies and Web 2.0 Tools to Improve Performance in Math

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**Setting and Context**

This capstone will take place at Russell Elementary School. Russell Elementary School is a Title 1 school. Russell Elementary is located in Smyrna, Georgia and is apart of the Cobb County School District. This is a suburban area in Cobb County. Russell is 48% black, 31% Hispanic, 16% white and 4% two or more races. Russell is 47% female and 53% male. Of its students 70% participate in free or reduced- priced lunch program and 22% that are English Language Learners. Russell has about 800 students that range from special needs pre-kindergarten to fifth grade. Along with providing special needs pre-kindergarten, the school provides HAVEN classes. HAVEN classes are classes for students with severe disabilities. Russell is on a traditional schedule. The school has uniforms for the dress code that every student is required to follow. Russell has after school activities such as chorus, Space Team, Girls On The Run, cheer club, dance club and bricks for kids. Russell Elementary focuses on STEM and uses CTLS touchstones. Russell is also a PBIS school. PBIS is a behavior program that Russell follows school wide. With the PBIS program each classroom has a behavior chart that includes the colors red, yellow, green, blue and purple. Each day all students start on green which means they are ready to learn. Students move colors based on behaviors, good behaviors move them up and negative behaviors move them down. When students show negative behavior they move down to yellow which means they are thinking about their behavior. If the negative behavior continues students move down to red, which is parent contact. If students fix the negative behavior they can move back up on the chart. Positive behaviors cause students to move from green to blue, which is showing pride. If students are going above and beyond they move to purple, which means role model.

Russell has a lot of technology devices available for the students and staff. Each staff member has his or her own laptop. Each homeroom classroom has four desktop computers and two laptops available for students. There are two computer labs in the building for teachers to use with their students. There is also an iPad cart for teachers to rent out from the media center, and there are iPads available to teachers for their classrooms for the year.

The Russell staff is made up of five homeroom teachers per grade, kindergarten through fifth grade. All kindergarten classes except one have a paraprofessional teacher in the classroom. First grade through fifth grade has one inclusion class that has a certified special education teacher. At the school there are two reading recovery teachers, two speech teachers, two academic coaches, a temporary technology coach, ESOL teachers and two counselors. The majority of the staff has been in education for more than ten years. Only about five teachers have been teaching five or less years.

Russell Elementary is made up of a staff of a little more than one hundred members. The school has a principal, Tammy Watson, an assistant principal, Erin Schularick, and a special education administrate, Ginger McDowell. All teachers who teach kindergarten through fourth grade teach all content areas. These include math, reading, writing, science, and social studies. In fifth grade there is one teacher who teacher who teaches all subjects and the remainder of the grade is departmentalized. Departmentalized means that each teacher only teaches two subject areas and the students switch classes for half of the day.

 The staff members and administrators at Russell will be used as the stakeholders for this capstone project. The capstone project has been discussed and approved with the principal, Tammy Watson, of Russell Elementary School. Mrs. Watson has agreed that professional development to help with instructional strategies and using technology to help with achievement in mathematics will benefit Russell. Mrs. Watson has agreed to the start of the professional developments for this capstone to take place during the 2017-2018 school year.

**Capstone Problem and Rational**

 Math is a content area that is required and essential in schools. Math is an important subject that students are tested and evaluated on when they take standardized test. In Georgia when students take the Milestone, math is a subject that is evaluated in third and fifth grade to determine of students need to move on to the next grade. Students across the nation are falling behind in the subject of mathematics. Lauren Camera wrote that the average math score had dropped from 2013 to 2015. The article U.S. students’ academic achievement still lags that of their peers in many other countries, discusses how US students are ranked low in math compared to other countries. Based off of just these two articles it is clear that educators need to find more ways to teach math and find new ways to help student grasp the concepts in math that they are expected to master.

Teachers will be given professional developments on instructional strategies and web tools that will help with the performance of Russell students in the area of math. There will be tools such as MobyMax used and teachers will learn strategies for instruction that will help students retain information better In the article What is the Importance of Professional Development for a Teacher?(Davies 2010) , it states that Professional development for a teacher is necessary, as new teaching information, techniques, and methods are continually being updated and changed. The article states that our education and experience alone will not be enough to serve us throughout our whole career. Teachers will have the opportunity to request professional developments on tools that they have heard of and want to know more about. The training for teachers will last about an hour and will take place after school hours. These hours will be 2:45pm to 3:45pm. Information from sessions will be placed in the school OneNote notebook for staff members who need access to it.

 Each professional development course will be centered on learning about one or two new strategies or learning about one or two Web 2.0 Tool. Each session will start with a follow up from the previous session. During this time teachers can share how the strategy or tool worked in their classroom. The facilitator of the professional development will teach and model for the next part of the session and then the remainder of that session will give teachers an opportunity to practice.

There are many opportunities for professional development in schools, and at Russell there is also opportunity for teachers to request the types of professional development that they are interested in having conducted. Russell has accessible technology and teachers have the ability to use any Web 2.0 tools that they feel will be beneficial to their students. There are teachers who use Web 2.0 tools to give students additional practice on certain standards, but there are not many teachers who incorporate Web 2.0 tools into their instruction.

 Based on assessments such as the Milestone, Math Inventory (MI) and CTLS touchstones, students at Russell are not performing well in math. Students at the school lack number sense and have trouble with constructive responses in math. The school has even added an enrichment time for the last thirty minutes of each day and Friday math for two hours. This time is for teachers to focus on math skills students are struggling with and to work on constructed responses in math. The staff at Russell Elementary School believes that technology is a key aspect of closing the achievement gap. They think that technology is becoming a key factor in keeping students engaged in learning and in enriching students in all content areas. Technology can give students more experiences as long as they are used appropriately. In the article Factors influencing digital technology use in early childhood education, it states from a survey of 1,234 early childhood educators that attitudes towards the value of technology to aid children’s learning have the strongest effect of technology use. This is followed by students’ confidence and support in technology. With the combination of instructional strategies and web tools, teachers at Russell will be able to improve the math scores school wide. In an age where technology is taking over education, we must find ways to adapt and prepare students to constantly use technology. As we teach students how to use technology, we as teachers must continue to teach ourselves how to effectively use technology in the classroom in collaboration with instructional strategies to help with student achievement. Technology engages students and is an amazing resources to give students additional practice and help with student understanding of a topic.

Teachers have access to technology, but not all teachers have an understanding on how to use instructional strategies and technology to help conduct effective instruction for students. Some teachers at Russell do not believe that technology is a key factor in math instruction. Some teachers at the school are not comfortable with technology or have been teaching a certain way for so long that they have a system that already works for them in the classroom.

The majority of the teachers at Russell use Promethean Boards to show videos, complete problems and have students work out problems together. Some teacher are more comfortable and knowledgeable of what can be done with the board and use it interactive activities in their lessons. At the school, teachers can do a better job at using Promethean Boards to their full capability. The staff at Russell uses Web 2.0 tools in the classroom, but they the staff needs to find more ways to incorporate technology in instruction.

**Objectives**

The professional development objectives for this capstone have been developed based off of both the National Educational Technology Standards (NETS) and International Society for Technology in Education (ISTE). The goal of the professional developments is to provide teachers with instructional strategies teaching math and showing teachers effective tools to integrate into their math lessons.

Project Objectives:

* By December 2017, teachers will increase their use of Web 2.0 technology in their mathematics lesson
* After finishing courses teachers will be confident in implementing and integrating new Web 2.0 tools into their instruction
* By December of 2017, teachers will be able to implement new instructional strategies when teaching math

Objectives For Teachers:

* Teachers will be able to use a variety of instructional strategies to help prepare students for math assessments
* Teachers will be able to integrate Web tools into their math lessons to help work towards student achievement in math
* Teachers will be able to use instructional strategies and Web 2.0 tools to help towards the achievement of students on math assessments
* Teachers will be able to model how to use Web 2.0 tools in a math lesson
* Teachers will have confidence when using instructional strategies and Web 2.0 tools during the instruction of math

**Deliverables**

The deliverables for the objectives in this capstone will be tied into the teachers’ math lessons. I plan to coach teachers on integrating new instructional strategies and coaching teachers through integrating Web 2.0 tools to their capacity. I will help teachers understand the importance of technology in education and help teachers see the benefits in using technology to its highest capacity. In the professional development courses there will be use handouts, videos, websites and I will modeling from the instructor. The participants will integrate strategies and Web tools learned from the professional developments. After integrating the strategies and tools and having students take the MI, teachers will reflect their experiences. Teachers will see the effects during the math inventory (MI) assessment that is given to students three times a year.

**Standards**

**PSC**

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.

(PSC 1.1/ISTE 1a)

1.2 Strategic Planning- Candidates facilitate the design, development, implementation, communication, and evaluation of technology-infused strategic plans. (PSC 1.2/ISTE 1b)

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.(PSC 1.4/ISTE 1d)

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.(PSC 2.1/ISTE 2a)

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.(PSC2.2/ISTE 2b)

2.3 Authentic Learning-Candidates model and facilitate the use of digital tools and resources to engage students in authentic learning experiences.( PSC 2.3/

ISTE 2c)

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).(PSC 2.4/

ISTE 2d)

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.(PSC 2.5/ISTE 2e)

2.8 Data Analysis- Candidates model and facilitate the effective use of digital tools and resources to systematically collect and analyze student achievement data, interpret results, communicate findings, and implement appropriate interventions to improve instructional practice and maximize student learning.(PSC 2.8/ISTE 2h)

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. (PSC 3.1/ISTE3a)

3.2 Managing Digital Tools and Resources- Candidates effectively manage digital tools and resources within the context of student learning experiences. (PSC 3.2/ISTE 3b)

3.3Online & Blended Learning-Candidates develop, model, and facilitate the use of online and blended learning, digital content, and learning networks to support and extend student learning and expand opportunities and choices for professional learning for teachers and administrators.(PSC 3.3/ISTE 3c)

3.4 Adaptive and Assistive Technology-Candidates facilitate the use of adaptive and assistive technologies to support individual student learning needs.

(PSC 3.4/ISTE 3d)

4. Digital Citizenship & Responsibility - Candidates demonstrate the knowledge, skills, and dispositions to model and promote digital citizenship and

responsibility.

4.2 Safe, Healthy, Legal & Ethical Use- Candidates model and facilitate the safe, healthy, legal, and ethical uses of digital information and technologies. (PSC 4.2/ISTE 5b)

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.(PSC 5.1/ISTE 4a)

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.(PSC 5.2/ISTE 4b)

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.(PSC 5.3/ISTE 4c)

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.(PSC 6.1/ISTE 6a, 6b)

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.(PSC 6.2/ISTE 6c)

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.(PSC 6.3)

**Project Description**

This project is to help Russell Elementary school use technology and instructional strategies to improve math scores. Currently, students at Russell struggle in mathematics and their MI, CTLS touchstone and Milestone scores show it. The purpose of this project will be to professionally develop the teachers in their approach to math. This new approach will make math more engaging for students with the use of technology and new instructional strategies. The deliverables for the objectives in this capstone will be tied into the teachers’ math lessons. I will use the PSC standards to drive my instruction to the teachers.

 This problem will begin with more in depth research of the math scores at Russell. The purpose of the project is to improve the math scores through technology integration and instructional strategies, therefore, I will have to research both of these things. I have determined my objectives so I will have to plan how to get the teachers where I want them in my time frame. I will also have to plan how to engage the teachers at Russell in my professional development, so that they will incorporate my trainings into their lessons. When working with the teachers at Russell I will need, laptops, a smart board, handouts, manipulatives if they are needed for the sample math lesson and any assessments and/or surveys.

 Each session of professional development will include me modeling a Web 2.0 tool or instructional strategy. During the session I will not only model, but I will give teachers the opportunity to practice with the tool or strategy. Sessions will also have time for teachers to ask questions and get feedback. After each session there will be a survey to help better prepare for the next session. Each session will last about an hour and any teacher who needs additional time will receive it.

 To assess the knowledge of the teachers, I will watch teachers implement what they have learned into their lessons. I will also have teachers give feedback on how the lessons work in their classroom with technology integration and new instructional strategies. Teachers and I will look at the MI and CTLS touchstone scores through the year to see if the integration of technology and instructional strategies helped improve scores. Unfortunately, we can not use the Georgia Milestone to assess the project due to the students not taking the exam until April of 2018 and the scores coming back later than that. If this project is successful, the goal is for teachers to use technology in everyday math instruction and to use the learned instructional strategies.

**Evaluation Plan**

 The reason this capstone is being conducted is to help solve Russell Elementary School’s problem with math scores. The teachers of Russell will attend professional development courses to learn new instructional strategies and to lean about Web 2.0 tools that will help with their classroom instruction for math. The goal is that by the end of the professional development courses teachers will be able to effectively implement the instructional strategies and Web 2.0 tools taught.

This capstone project being successful will depend on the implementation of the instructional strategies and Web 2.0 tools. This will be assessed formatively through discussion at the professional development courses. During the professional developments the teacher will have an opportunity to share how they are implementing the strategies and tools in their classrooms and how their students are doing with the implementation of the strategies and tools. I will take notes on the discussion and analyze what teachers have said to see what they have gained and to see what I can include in future courses. I will also use three online survey to determine what the teachers want to gain, are gaining and to see how the teachers feel about my performance in facilitating the courses. This survey will be given prior to beginning courses, at the mid point course (course three), and after the final course.

**Timeline**

Each professional development that I conduct will be one hour long. I will stay additional time after each session for staff members who have questions or need extra assistance.

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| **Date** | **Description of Activity** |
| August- September | Research and begin developing/ creating the professional development activities. This is where I will find videos, article and any other resources needed |
| September | I will conduct Professional Development Course 1 for one hour |
| September | I will conduct Professional Development Course 2 for one hour |
| September | I will conduct Professional Development Course 3 for one hour |
| September | I will Conduct Professional Development Course 4 for one hour |
| Late September or Early October | I will conduct Professional Development 5 for one hour |
| October- March | Evaluation materials will be created and distributed Collect and Analyze Data Collected |

**Resources Needed**

To complete this capstone I will need to reserve our school media center or global forum for all five professional development courses. In both areas of the school building I have a place to present through a projector or Promethean board. I will use the Internet and library to conduct my own personal research. I will use survey monkey to complete the surveys used for the pre, middle and post survey assessments. Teachers will use their personal laptops at the sessions.

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