

**Ann Ossey**

## **Professional Development Proposal**

**Title:** Integrating STEM in the Art Classroom: Coding, Robotics, and 3D Printing

**Why?:** I selected this topic because it aligns with my capstone project for Northeastern State University. I am completing the curriculum project which includes an eight lesson curriculum and professional development program.

**Who?:** This is the part that I am still trying to figure out. I am a bit nervous about meeting the 12 attendee requirement. My district is very strict about PD. I might be able to deliver the PD to teachers who volunteer their time for the sake of enrichment, even if they will not get credit for it at the district or state level. I am hoping to talk more with my principal now that I have details on what this PD is supposed to look like. The other possibility is using teacher Facebook groups I am in to share and lead my PD.

While the capstone project is a curriculum geared towards the middle school level, the professional development could be applicable to all grade levels and all subject areas. I have designed and lead professional development in the past where it was art teacher focused but I ended up having teachers k-12 and all content areas taking the course in my school district. They found ways to apply the learning with the context of the content areas they teach. The number of students that these teachers teach, would ultimately depend on how I deliver the PD. In my district, a specials teacher (art, PLTW, music, and Family Consumer Science teacher) teach 210 students a day. Language arts teachers teach 100 students. Math, science, and social studies teach 175 students a day. Special education staff may have a much smaller group depending on their caseloads and needs of students.

### **STEM Concepts/Learning Goals:**

Participants will design a lesson using the 5e model.

Participants will engage and apply integrated STEM learning experiences.

Participants will make connections across content areas standards: NGSS, CCSS, NCAS

Participants will engage in collaborative and hands-on learning.

### **Materials:**

Computers

iPad with Scratch Jr.

Spheros or Hummingbirds\* (I may not be able to secure this technology, but it is my hope)

3D Printer(s)

### **CCSS (Common Core State Standards):**

#### **ELA**

CCSS.ELA-LITERACY.CCRA.SL.2

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

CCSS.ELA-LITERACY.CCRA.SL.5

Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

CCSS.ELA-LITERACY.CCRA.L.1

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

CCSS.ELA-LITERACY.CCRA.L.2

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

## **Math**

Math Practices

MP.1 - Make sense of problems and persevere in solving them

MP.2 - Reason abstractly and quantitatively

MP.5 - Use appropriate tools strategically

MP.6 - Attend to precision

MP.7 - Look for and make use of structure

MP.8 - Look for and express regularity in repeated reasoning

Operations And Algebraic Thinking

## **ISTE Standards for Students (International Society for Technology Education Standards:)**

1. Creativity and Innovation
4. Critical Thinking, Problem Solving and Decision Making
6. Technology Operations and Concepts

**How and Where?:** My first intention is to lead this professional development in a face to face format. Partly because I want to work through the anxiety of leading my colleagues in these type of situations. It is easy for me to “hide” behind a digital platform in PD. If I want to strengthen my leadership abilities, I feel it is necessary that I gain more experience in face to face formats. However, I may end up having to utilize my Facebook group to deliver the PD if my district is not willing to cooperate with me.

**When?** My hope is to lead this professional development in March. Our spring break is the first week of April. I would have the second week of April as a last resort, however, that will be state testing so it is not an ideal time. Plus, with the assignment due April 16<sup>th</sup>, that wouldn't leave a lot of time to complete the final report. My plan is for the PD to be 1-2 hours. The time might be separated with a week in between for teachers to have time to explore and work hands-on and then come back together to share experiences.

## **Pre- and Post-Survey Questions:**

Pre-Survey Questions Sample:

1. What is the grade level you teach? (Elementary, Junior High, High School)
2. What content area(s) do you teach?

3. How would you define student-centered learning?
4. How would you define project-based learning?
5. How would you define inquiry-based learning?
6. What do you hope to learn as a result of this professional development?

Post-Survey Questions Sample (if teachers want to get actual credit by the state of Illinois, the post-survey has to be this one [https://www.isbe.net/Documents/77-21A\\_evaluation.pdf](https://www.isbe.net/Documents/77-21A_evaluation.pdf), but I can have an additional one that will provide me with specific feedback as to what teachers' have learned specifically in my PD course)

1. Define the 5e model.
2. How might you implement the 5e model into your content area?
3. Give an example of how you will implement your learning from this PD into your professional practice as a teacher?

**Intended Outcomes:** I would hope that the attendees have an understanding of inquiry-based learning and the 5E model as a result of attending this professional development. Additionally, I would hope they would be able to find ways that they could implement coding, Google CS first resources, 3Dprinting, (and even robotics) into their classroom even if they do not teach STEM/STEAM classes. Lastly, I want teachers to experience hands-on learning in the tools they would be implementing with their students.

**Follow-up with Teachers in Attendance:** I will collect teachers' contact information and follow-up with them. I could also create a twitter handle or a Facebook group where teachers involved in the PD share out images of lessons that are implemented in their classrooms as a result of the professional development. If the PD is offered to just my in-district teachers, we use Canvas (like Blackboard). I will create a Canvas course where all resources can be accessed. Teachers can engage in discussion boards long after the PD commences and share resources they have developed following the PD experience.

**What data collection methods (e.g. surveys, interviews) will you use to analyze the PD'S success?** I will use Google Forms to create pre- and post- surveys to analyze the success of the professional development. If needed I will randomly select two or three teachers to interview for feedback regarding the professional development.