Rice Professional Development Proposal

Title

Engage and Explore: The building blocks of creating a meaningful lesson using the 5E Model.

Topic Selection

One of the most valuable things that I have learned in my Endeavor courses is the 5E Model. The 5E Model helped me to understand the value in letting students lead their learning. After talking with my boss about facilitating a professional development session, she offered an opportunity for me to give this professional development to a group of new faculty members. These faculty members range from classroom teachers to specialists throughout our elementary school (K-5). I wanted my topic to embody the exploratory nature of STEM while also remaining applicable to a wide range of educators, backgrounds, and classroom settings.

Integration of NASA Resources and Endeavor Content

My professional development session will highlight the 5E Model that I used in many of my Endeavor courses. The 5E Model is a framework that organizes teachers' lessons in phases of engagement, exploration, explanation, elaboration, and evaluation. For this particular session, I will concentrate on the first two phases: Engage and Explore. These are the initial phases and are crucial as they set the stage for inquiry-based learning. These two steps help students develop a deeper understanding of the subject matter at hand. I will also be sharing resources from NASA that teachers can incorporate during the Engage and Explore phases of learning such as the NASA Jet Propulsion Laboratory (JPL) website and NASA's learning resources. I am also planning on showing a lesson that I have done that uses the 5E Model.

Proposed Audience

As mentioned previously, my audience is diverse. I have a group of 9 new faculty members:

1. P.E. teacher (grades Pre-K and Kindergarten) - About 120 students
2. Three instructional aides (grades 2-4) - About 190 students
3. Two Pre-K teachers - About 40 students
4. Two Kindergarten teachers - About 40 students
5. Music Teacher (grades 1-5) - About 315 students

Integration of STEM Topics and Goals

STEM, by nature, is inquiry-based. STEM lessons often emphasize hands-on, experiential learning where students are actively engaged with materials, tools, and technologies. In traditional classrooms, lessons are typically lecture-based or utilize passive learning. Lessons are also centered around a specific, structured curriculum where answers are almost predetermined. In a STEM lesson, students are not just receiving information from a teacher, rather, they are actively engaged in and participating in their own learning. This naturally fosters curiosity, critical thinking skills, and problem-solving skills. In STEM, students are encouraged to look at real-world problems or scenarios and bring them into the classroom setting. At the Engage phase

of the 5E Model, students are at the beginning phases of getting interested in what they are learning. Teachers will learn strategies to capture students' interest and increase their curiosity about a topic using a variety of STEM-based techniques such as hands-on activities, real-world examples, and open-ended questions to spark student interest. The goal here is to motivate students to be interested in learning the topic at hand. During the Explore phase, we will focus on how to provide students with opportunities to explore the topic further through inquiry-based activities, experiments, or investigations. My hope is that these teachers will learn how to facilitate these explorations.

NGSS Standards

Many of the teachers that I will be working with in this professional development session do not utilize NGSS/science standards in their classrooms as they are not science-specific teachers.

Timing and Audience Selection

My allotted time is 1 hour and I plan to use the entire hour for the professional development session. Since the audience was already selected for me, I won't need to recruit an audience, but I will focus on engaging with my audience prior to the session. I think this audience could benefit from a brief introduction/overview of the professional development topic and a preview of what our time together will look like. I plan to send the initial information out a week or two in advance.

Pre- and Post Survey

My pre-survey is centered around my audience's comfortability with implementing the 5E Model. My questions will also measure if they have any student-led learning happening in their classrooms currently. Some of my sample questions are:

1. How comfortable do you feel with implementing engaging activities to capture students' attention?
2. How often do you incorporate hands-on exploration and inquiry-based learning activities in your lessons?
3. What are some challenges you face when attempting to engage students in lessons?
4. How much of your lesson time is student-led?
5. How comfortable are you in facilitating student-led investigations and hands-on exploration during lessons?

Post-Survey questions will measure the teachers' knowledge and attitudes towards the 5E Model after the professional development session. I would also measure the likelihood of them implementing the 5E Model into their classrooms after the professional development session. Sample questions include:

1. On a scale of 1 to 10, how valuable did you find the strategies and examples provided for engaging students using the Engage and Explore phases of the 5E Model?

2. How likely are you to try new strategies for facilitating student-led investigations in your classroom?
3. Would you be interested in attending a professional development session on the remaining steps of the 5E Model?

Outcomes and Expectations of Educators

I am hoping that the teachers attending my professional development walk away with knowledge and tools that they can implement in their classrooms. The 5E Model is a method of lesson planning that can help teachers foster engagement. My objectives include:

1. Understand the importance of the Engage and Explore phases in the 5E Model.
2. Learn practical strategies and techniques to implement these phases effectively in their classrooms.
3. Explore ways to differentiate instruction in order to motivate students of all levels, interests, etc.
4. Recognize the benefits of STEM-based learning, even in non-STEM classrooms and across all curriculum/content areas

Follow-up Plan

I am genuinely curious about how teachers will conceptualize the 5E Model and would like to follow up with them about implementation in their classrooms. The best method for this would be E-mail or in-person observations. Being able to watch a teacher take the concepts from the professional development session and put the 5E Model into action would be rewarding.

Measuring Success

To analyze the success of my professional development, I am choosing to utilize post-surveys and interviews. I would expect the interviews to be conversational and informal to gauge their success in implementing the 5E Model in their classrooms. I would also utilize this time to provide additional resources if needed.