



SIUE's Farthing takes top prize for STEM education research at Illinois State Academy of Science annual meeting

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Focus Question

How can an elementary teacher who is pressured to focus instructional time on literacy make room for subjects like science?

Context of Investigation

- Assignment for course that required me to implement STEM lessons.
- Lessons were implemented in a second grade classroom in November 2017.
- Newly hired in district where lesson unit was taught.
- **School average: 145 minutes on literacy, 40 minutes on science.**
- Lesson unit loosely based on Engineering Is Elementary program.
- I will be a first year teacher in fall of 2018. I was hired by the district where lessons were taught.

NGSS Standard

2-LS2-2 Ecosystems: Interactions, Energy, and Dynamics
Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.

Modeling at Grade 2

Modeling in K-2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events.



SAE
Elementary Education

SIUE

Ashley Farthing

Identifying Important Literacy Outcomes in an Elementary Science Lesson: A Pollination Study

Learning Plans

Three class period unit on pollination that was interlarded in including literacy.

Day 1

Students began the learning segment by **speaking** as a whole group about what they knew about pollination.

- CCSS.ELA.LITERACY.SL.2.1B

Build on others' talk in conversations by linking their comments to the remarks of others.

Students **read** from their science textbook about pollination.

- CCSS.ELA.LITERACY.R.2.1

Ask and answer questions as who, what, where, when, why and how to demonstrate understanding of key details in a text.

Day 2

Students **verbally shared** information with a partner as a review.

- CCSS.ELA.LITERACY.SL.2.1

Participate in collaborative conversations with diverse partners about grade 2 topics.

Students then **viewed and listened** to a video shown that described the different types of pollination.

- CCSS.ELA.LITERACY.R.2.8

Recall information from experiences or gather information from provided sources.

- CCSS.ELA.LITERACY.SL.2.2

Report or describe key ideas or details from a text read aloud or information presented orally or through media.



Students **wrote** responses to questions regarding what had been learned about pollination.

- CCSS.ELA.LITERACY.W.2.2

Write informative/explanatory texts in which use facts and definitions to develop points.

Conclusions

- Goal was not to have literacy over the science, rather to support literacy outcomes in doing quality science instruction, a teacher is also supporting literacy outcomes.
- When I closely examined the Science and Engineering Practices associated with NGSS, I was able to demonstrate that important literacy outcomes are easily achieved while teaching science if additional planning done and lesson structure is rearranged. Many of the practices already include literacy based actions.

1. Using context to discuss and understand the meaning.
2. Analyzing and evaluating evidence.
3. Analyzing and evaluating evidence.
4. Analyzing and evaluating evidence.
5. Analyzing and evaluating evidence.
6. Analyzing and evaluating evidence.
7. Analyzing and evaluating evidence.
8. Analyzing and evaluating evidence.

Lessons Learned

- Students appeared more motivated by activities that included model building.
- Time is a factor. Three class periods was not enough.



EDWARDSVILLE - Southern Illinois University Edwardsville senior Ashley Farthing can't imagine a future doing anything but teaching. She'll walk across the stage to receive her bachelor's in elementary education during commencement on Saturday, May 5, knowing a classroom of first graders eagerly await her fall 2018 arrival.

Farthing has secured a teaching position at Lincoln Elementary in her hometown of Marion. Her journey at SIUE has featured solid academic coursework, experiential learning opportunities, impactful mentorship and involvement in extracurricular activities, all of which have prepared her for a successful future.

"I have loved my time at SIUE and am grateful for the wonderful elementary education program," she said. "My professors have always been supportive and involved in my education, and I know they truly care about each of us teacher candidates."

Among her list of accomplishments, is first place for her research poster presentation in the STEM (science, technology, engineering and mathematics) Education category at the Illinois State Academy of Science's (ISAS) annual meeting held Friday, April 13. Her project was entitled "Identifying Important Literacy Outcomes in an Elementary Science Lesson: A Pollination Study."

"In an average elementary classroom, 140 minutes are spent daily on literacy instruction, whereas only 40 minutes, on average, are spent on science instruction," Farthing explained. "I was challenged to create a science content lesson series that incorporated multiple modalities of literacy. Students were able to use literacy practices, such as reading, writing, speaking and listening, while learning the science concept of pollination."

"It was a great opportunity to practice integrating different subjects into my daily teaching practice," she added. "Through my research, I saw that students were more engaged in hands-on learning and looked forward to each day's science lesson."

According to Elementary Education Program Director Stephen Marlette, PhD, Farthing's project clearly articulated the strong overlap between literacy and science. He notes that her willingness to share her research findings is an important quality among educators.

"The elementary education program is proud of Ashley," Marlette said. "We are committed to preparing elementary teachers like her who skillfully meet important literacy outcomes in content areas such as science without sacrificing the nature of the discipline."

Farthing's scholarship demonstrated her passion and advocacy for the teaching profession, which Marlette emphasizes has been consistently displayed by her cooperating teachers and program instructors.

“As education advocates, teachers must continuously read books and articles to remain on top of important learning research,” Marlette explained. “They also engage in discussions with other professionals about student needs. Our program has adopted a field instrument that provides candidates with feedback on how they are doing in this area. Our cooperating teachers and program instructors help shape each of our students for professional success.”

The mission of the ISAS is to promote scientific research, the diffusion of scientific knowledge and the unification of scientific interests in Illinois.

Its STEM education category is relatively new, and was organized by SIUE's Jessica Krim, EdD, School of Education, Health and Human Behavior interim assistant dean and associate professor in the Department of Teaching and Learning.

The [SIUE School of Education, Health and Human Behavior](#) prepares students in a wide range of fields including public health, exercise science, nutrition, instructional technology, psychology, speech-language pathology and audiology, educational administration, and teaching. Faculty members engage in leading-edge research, which enhances teaching and enriches the educational experience. The School supports the community through on-campus clinics, outreach to children and families, and a focused commitment to enhancing individual lives across the region.