

Another Advancement In

STEM Education



Iowa State University informing decision-makers about research in Science–Technology–Engineering–Mathematics Education

Teaching science transcends textbooks and test tubes

The teaching of science class at Iowa State University isn't the average lecture, or even instructional course. On a daily basis, students can be found solving science mysteries, creating their own puzzles, or challenging traditional teaching methods. Consider it a hands-on, minds-on approach to science education.

EunJin Bang, assistant professor in curriculum and instruction, developed the teaching of science course after teaching a similar class as a graduate student. Tweaking the curriculum to meet the needs of young science and math educators, Bang lets the students' natural inquiry guide the class.

"Most pre-service teaching students have a fear of teaching science," Bang said. "This class is designed to allow them to have fun while learning, to let them explore topics at their own pace."

Bang models the class around the 5E method – engage, explore, explain, elaborate, and evaluate. The 5E model starts with questions related to the science topic and turns into an interactive search to find the answer. Students are encouraged to make claims based on the evidence found through observing, measuring, classifying, hypothesizing, data collecting, analyzing, and communicating. It's an approach, Bang said, that sticks with students.

"Every science education journal reports that inquiry science, or hands-on learning, is the best," Bang said. "Stimulating meaningful learning will stay with a student longer than a traditional lecture or textbook science."

The class, designed for future K-8 teachers, is unique in other ways, as well. Each student is required to keep a science journal detailing their day-to-day science encounters,



From left, science education students Kevin O'Brien, Jennifer Perusse, and Jacob Dannen analyze a teaching of science classroom activity.

and asking specific questions relating to the phases of the moon, life cycle of a mealworm, observing seed development, and experiencing the overall scientific process.

In addition to offering an engaging classroom environment, Bang has set up the class within the Second Life® virtual world and my.pbwiki. This high-tech mode of communicating, working, and learning is on the cutting edge of what future educators may use in their classrooms.

"These students will be teaching youth from the gaming generation," Bang said. "It's important for teachers to know what kids are doing and be prepared for that kind of technology. The virtual environment is the new learning environment where students can exercise collective inquiry."

For some, Bang's approach to science teaching may be unconventional, yet research, as well as Bang's own experiences, speak well for this teaching and learning method.

"I try to bring in many different aspects of the sciences into what I teach," Bang said. "When these future teachers can take these lessons into their classrooms, it will enhance what students learn and how they come to view science."

For more information:

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