

Georgia Southern University

## Georgia Southern Commons

---

Interdisciplinary STEM Teaching & Learning  
Conference (2012-2019)

2019 Interdisciplinary STEM Conference (March  
21-23, 2019)

---

Mar 22nd, 2:45 PM - 3:30 PM

### Using LEGO Robots to Support Understanding of Absolute Value in a Mathematics Classroom

Ann Mitchem

Georgia Southern University, js16108@georgiasouthern.edu

Jillian Arnold

Georgia Southern University, ja06070@georgiasouthern.edu

Shelli Casler-Failing

Georgia Southern University, scaslerfailing@georgiasouthern.edu

Follow this and additional works at: <https://digitalcommons.georgiasouthern.edu/stem>

---

#### Recommended Citation

Mitchem, Ann; Arnold, Jillian; and Casler-Failing, Shelli, "Using LEGO Robots to Support Understanding of Absolute Value in a Mathematics Classroom" (2019). *Interdisciplinary STEM Teaching & Learning Conference (2012-2019)*. 20.

<https://digitalcommons.georgiasouthern.edu/stem/2019/2019/20>

This event is brought to you for free and open access by the Conferences & Events at Georgia Southern Commons. It has been accepted for inclusion in Interdisciplinary STEM Teaching & Learning Conference (2012-2019) by an authorized administrator of Georgia Southern Commons. For more information, please contact [digitalcommons@georgiasouthern.edu](mailto:digitalcommons@georgiasouthern.edu).

# Using LEGO Robots to Support Understanding of Absolute Value in a Mathematics Classroom



Ann Mitchem, Jillian Arnold, and Dr. Shelli Casler-Failing

Georgia Southern University

Department of Middle Grades and Secondary Education

# Purpose of Research

The purpose of this research was, and is, to determine if providing opportunities for pre-service mathematics teachers to learn with, and about, LEGO robotics technology increases the likelihood of incorporating robotics lessons into their mathematics curricula when they become in-service teachers.

# Research

- For pre-service teachers to develop TPCK they must develop in-depth knowledge of their content area in parallel with their development of technological knowledge (Niess, 2005).
- “[L]earning subject matter with technology is different from learning to teach that subject matter with technology” (Niess, 2005, p. 509).



Niess, M. (2005). Preparing teachers to teach science and mathematics with technology: Developing a technology pedagogical content knowledge. *Teaching and Teacher Education*, 21, 509-523.

# The Scenario

- Students were enrolled in a math methods course
- Students learned how to build the robots and learned how to create programs to operate the robots with and without sensors
- Students worked in pairs to create a math lesson using the robots to teach a concept of their choice
- Students taught the lesson to their peers

# The Lesson

- Designed for a 6<sup>th</sup> grade classroom
- Requires only one 45 minute class
- Incorporates 7 out of 8 mathematical practices
- Helps students understand absolute value refers to a *distance* from zero
- Supports students' accurate use of absolute value notation
- Supports students' understanding of adding absolute values

# Let's Learn with Robots!

As you are working through the lesson we will circulate about the room to answer any questions you may have.



# Debrief

- What are your thoughts about this experience?
- What do you perceive as the benefits for students?
- What hurdles do you think would prevent you from incorporating robots into your classes?
- What questions do you have for us?



# Thank you!

Ann: [js16108@georgiasouthern.edu](mailto:js16108@georgiasouthern.edu)

Jillian: [ja06070@georgiasouthern.edu](mailto:ja06070@georgiasouthern.edu)

Dr. CF: [scaslerfailing@georgiasouthern.edu](mailto:scaslerfailing@georgiasouthern.edu)



**GEORGIA  
SOUTHERN**  
UNIVERSITY

# Lesson Resources

Using LEGO Robots to Teach Absolute Value

[-Lesson plan and student task sheet](#)



**GEORGIA  
SOUTHERN**  
UNIVERSITY