

Georgia Southern University

Digital Commons@Georgia Southern

Middle Grades & Secondary Education Faculty
Presentations

Middle Grades and Secondary Education,
Department of

3-22-2019

Using LEGO robots to support understanding of absolute value in a mathematics classroom

Ann Mitchem

Jillian Arnold

Shelli L. Casler-Failing

Follow this and additional works at: <https://digitalcommons.georgiasouthern.edu/teach-secondary-facpres>



Part of the [Education Commons](#)

This presentation is brought to you for free and open access by the Middle Grades and Secondary Education, Department of at Digital Commons@Georgia Southern. It has been accepted for inclusion in Middle Grades & Secondary Education Faculty Presentations by an authorized administrator of Digital Commons@Georgia Southern. For more information, please contact digitalcommons@georgiasouthern.edu.

Georgia Southern University
Digital Commons@Georgia Southern

Interdisciplinary STEM Teaching & Learning
Conference

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*. 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 Digital Commons@Georgia Southern. It has been accepted for inclusion in Interdisciplinary STEM Teaching & Learning Conference by an authorized administrator of Digital Commons@Georgia Southern. For more information, please contact 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 6th 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

Jillian: ja06070@georgiasouthern.edu

Dr. CF: scaslerfailing@georgiasouthern.edu



**GEORGIA
SOUTHERN**
UNIVERSITY

Lesson Resources

Using LEGO Robots to Teach Absolute Value

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



**GEORGIA
SOUTHERN**
UNIVERSITY