



# IMPACT OF STEM GUEST SPEAKERS IN THE MIDDLE SCHOOL SCIENCE CLASSROOM



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## FOCUS QUESTION

The study aimed to investigate the impact of STEM guest speakers on sixth-grade science students' pre-existing notions about STEM professionals.

## BACKGROUND

According to research, adults connect science with men more than women, and children frequently draw male scientists in their drawings. Gender stereotypes emerge as a result of social group observations and media exposure. On the other hand, women's participation in science has grown dramatically during the 1960s and 1970s, with women getting 48% of bachelor's degrees in chemistry in 2015 and being more frequently featured in popular children's television shows, science textbooks and magazines.

## METHODOLOGY

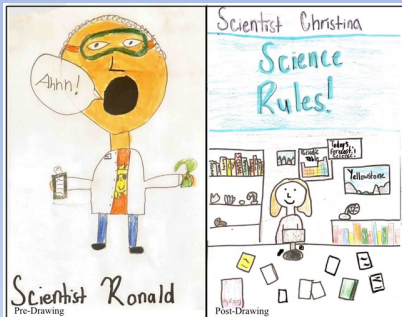
This study examined the impact of STEM guest speakers on sixth-grade students' preconceived notions of STEM professionals. Over five months, students were taught general science content in space science, earth science, and chemistry.

After completing the content, they participated in virtual interviews with STEM guest speakers. Students completed surveys and drawings to share their opinions on the interview and speaker.

## CONTEXT

The study took place at Memorial Elementary School in Hopedale, Massachusetts. The study involved 48 students and non-inclusion two classes, with 61% female, 39% male, and 100% white.

Figure 2. Student A. Pre-Draw-A-Scientist compared to Post-Draw-A-Scientist. Student A's Pre-Draw-A-Scientist to Post-Draw-A-Scientist model a theme of student drawing changing genders.



## DATA ANALYSIS

### Before the Treatment:

The Pre-Draw-A-Scientist Survey revealed students drew stereotypical scientists, with 64% drawing males, 74% adult-aged, 90% wearing lab coats, and 60% working on chemistry (Figure 1).

### After the Treatment:

The Draw-A-Scientist Survey showed scientists who accurately represented students, with 57% drawing females, 45% younger scientists, and 55% wearing lab coats (Figure 1). Seventy-six percent of students believed guest speakers changed their minds about who could be a scientist, and 62% inspired them to consider becoming one.

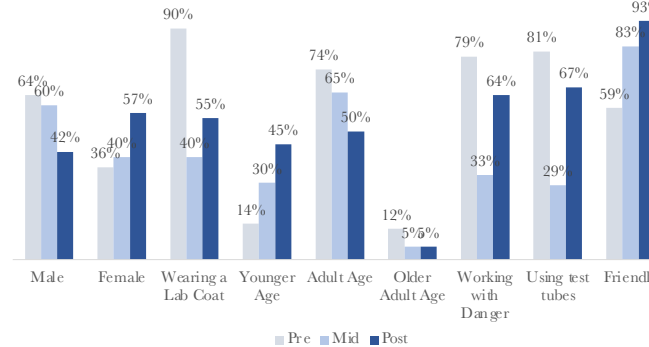


Figure 1. Comparison of results between the Pre-Draw-A-Scientist, averages of the Mid-Draw-A-Scientist, and Post-Draw-A-Scientist (N=42).



Figure 3. Student E's Pre-Draw-A-Scientist to Post-Draw-A-Scientist model a theme of student drawing change in the setting.

## RESULTS

Direct interaction with STEM professionals positively impacts sixth-grade science students.

## CLAIM, EVIDENCE, REASONING

**CLAIM 1:** Students better understood the diversity of STEM professionals' appearances. At the start of this treatment, students drew stereotypical scientists. The first Predictions of the Guest Speaker Survey data revealed that students also expected the STEM guest speakers to look like their stereotypical scientist drawings. Still, as the interviews continued, the predictions started to change.

**CLAIM 2:** Students started to see themselves as scientists. In the Post-Draw-A-Scientist drawings, the percentage of female scientists dominated male scientists, similar to the gender ratio of my sample. Additionally, in the drawings, students would draw their scientists and do activities we have done in the past.

**CLAIM 3:** The involvement of STEM guest speakers positively influenced my students to learn and explore science more and to see themselves in a STEM career. The results from the Final Thoughts Survey showed that these direct interactions with the STEM guest speakers inspired students to consider careers in STEM fields. Students explained that the guest speakers helped them understand what a job in science may look like.

Figure 4. Student C Pre-Draw-A-Scientist compared to Post-Draw-A-Scientist. Student C's Pre-Draw-A-Scientist to Post-Draw-A-Scientist model a theme of student drawing changing disciplines.

