Developing Middle School Students' Identities as a STEM Person through an Archaeology Afterschool Program

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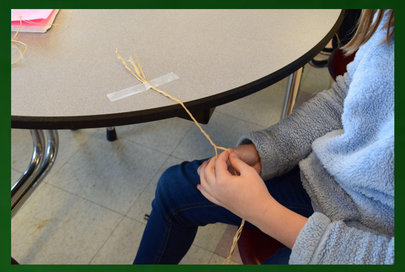

Introduction and Background

Identity, or "an individual's sense of self", is defined "a set of physical, psychological, and interpersonal **characteristics**" that are **unique to each individual** (APA Dictionary of Psychology).

- Defining one's identity takes place "within and is influenced by multiple timescales" (Carlone, 2012), such as a period of years, months, or even weeks.

This study is a small subsection of a larger NSF Grant focusing on the use of archaeology as a tool to facilitate STEM ideas and identity in two rural New York State public schools.

If you are interested in learning more about this grant, please scan the following QR code:

Study Aim

The purpose of this study was to examine the possible ways in which middle schoolers participation in an archaeological STEM after school program might **shape and shift their identity** as a STEM person.

Methodology

This study collected observational and identity reflection data from 24 middle school students in grades 6th through 8th. These students were enrolled in two rural New York public schools.

- *Observations/Field Notes*
  - Focused on the students' actions as well as conversations between fellow peers and /or BU student volunteers
- *Student Booklets*
  - Featured a two sided chart (one side featured a list of ten "identities", the other was left blank for student responses)
  - Students were asked to select the "identity(ies)" they were **most like** during the activities each week
  - Students explained their selection in one to two sentences
- Only students who filled out **3 or more days** in their *Student Booklets* were included in analysis

"Identities" and their Accompanying Definitions

Bravery	Worked out of one's comfort zone. Tried something new. Did something that was scary.
Investigator	Spent time trying to figure out how or why something works. Tried to come up with explanations by examining patterns.
Logician	Used reason and math knowledge.
Observer	Detected different STEM ideas while listening and/or watching others.

SCAN ME

For a comprehensive list of the ten identities and their definitions scan the QR code above.

SCAN ME

For a comprehensive table of how many students selected each identity for each activity scan the QR code above.

Anthony: *"I was a investigator. I used my senses to think what was in the box but got them all wrong minus two"*

David: *"I think we used bravery because we tried something new."*

Jenny: [Observer] *"...I examined a bone given to me and tried to figure out if it was young, old, what animal it was, if it was tampered with." ;*

Emma: *"Logician because we had to use meters, centimeters, and millimeters."*

Discussion of Findings

- Students interpreted each identity in a v**ariety of ways**
  - Students included language in their responses that **situated themselves as a certain identity** even if it was not one of their chosen identities
- Students' identified identities as STEM learners within the archaeological after-school program, along with the activities in which they were most prevalent, highlight possible instances in which a student's participation was shaping their developing identity as a STEM person.
  - Prior research has documented how the development of one's identity in a STEM discipline through early learning experiences is associated with pursuing a STEM career (e.g., Dou & Cian, 2020), fields that have a low number of historically excluded social identity groups (NSF, 2021).
- Limitations
  - Towards the end of the ten weeks, **less and less students** filled out their *student booklets*
  - Not all students enrolled in the program attended every week

Zena: [Investigator] *"Because I took time out to say what I thought it could do. And actually thought about it as I look over the item today."*

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