“ITS FACE IS SO CUTE!” ENGAGING STUDENTS IN SCIENCE INVESTIGATIONS USING DIGITIZED MUSEUM SPECIMENS

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THEME:

Engaging students in STEM education

BACKGROUND AND AIMS

Learning with objects serves as a basis for engaging learners via personal interest and motivation (Paris & Hapgood, 2002). However, real objects and specimens often are too fragile, valuable, small, or otherwise inaccessible for regular integration in science classrooms.

This poster explores the impact of digitized museum specimens on interest, enjoyment, and engagement during online science learning. While museum collections often inspire strong visitor responses, such as “gawking in awe” or “recoiling” (Alberti, 2005), little is known how digitized specimens impact learner experiences in online learning contexts. This work examines emotional reactions during use of an online investigation with entomology specimens (see Figure 1).

Figure 1. Screenshot of a Desert velvet ant from the online entomology investigation.

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METHODOLOGY OR PROCESS(ES) UNDERTAKEN

Twenty pre-service teachers in elementary education thought aloud as they worked with an online science investigation in entomology and then completed a survey about their learning experiences and perceptions. Think aloud utterances were analyzed for instances of emotional reactions to and engagement with digitized specimens. Average ratings of interest and engagement on Likert-style survey items (1 = Strongly Disagree, 6 = Strongly Agree) also were analyzed. Additional testing is being conducted in middle school classrooms with 6th grade learners. Data from these learners will be added to the poster for conference presentation.

RESULTS AND CONCLUSIONS

During use of the online investigations with digitized specimens, 95.2% of participants expressed at least one instance of strong reaction or emotional engagement. Reactions included positive statements (e.g., “Its face is so cute!”) as well as negative reactions (e.g., “It’s so scary. It’s kinda freaking me out right now.”). Overall, participants agreed that they enjoyed working with the digitized specimens (M = 4.65, SD = *.93*), the specimens looked realistic (M = 5.3, SD = .86), and digitized specimens were an effective way to increase science engagement (M = 5.4, SD = .68). Results suggest strong potential for digitized specimens to interest and engage learners during online science investigations.

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Its Face is So Cute! Engaging Students in Science Investigations Using Digitized Museum Specimens

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EPIC Bioscience

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EPIC Bioscience goals

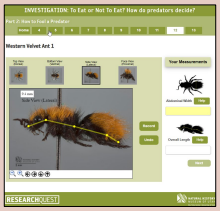
- Educational integration of high-quality, digitized museum specimens
- Students and teachers engaged by compelling, real-world specimens
- Students complete online investigations: authentic, NGSS-aligned

Theoretical & Research Foundations

- Object-based learning for engagement (Dierking, 2002; Paris & Hapgood, 2002)
- Museum collections often inspire emotional responses (Alberti, 2005)
- Users value virtual museum objects (Kyriakou & Hermon, 2019)

Materials

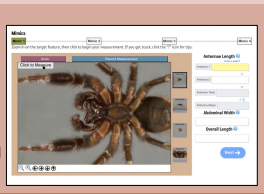
Online EPIC investigation. Users collect data directly from digitized specimens.



Learners control specimen views—clicking to switch between dorsal, ventral, lateral, and proximal views.

Method

20 pre-service teachers (15 female, 5 male; *M* age = 21) thought aloud as they completed an entomology investigation as a science learner. Zoom used to record screen & utterances.



At end of session, participants completed 6-point Likert-style items on perceived interest & enjoyment.

Sessions were transcribed and coded. Surveys analyzed for average agreement.

Sample Survey Items

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
The insects looked realistic.	○	○	○	○	○	○
I enjoyed working with the museum specimens.	○	○	○	○	○	○
I would like to go to the Natural History Museum of Utah to see these insect specimens	○	○	○	○	○	○

Key Findings

Utterances Demonstrate Strong Emotional Reactions to Digitized Specimens

"Oh! Its face is so cute!"

"Whoa! That's cool."

Spiders' eyes are very scary!

I'm scared to click on the face . . the face really has been freaking me out.

95.2% of participants expressed at least one instance of strong (positive or negative) emotional reaction while working with digitized specimens.

The velvet ant is kind of cute!

Wow. I have personally never seen this velvet ant . . . very intriguing!

"It's so scary.

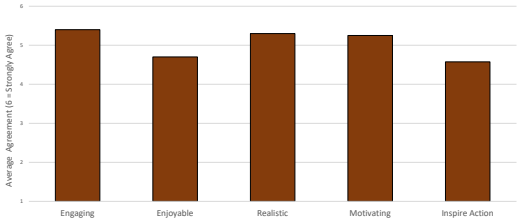
OK, eww! The ant is freaking me out!

Survey Responses Indicate High Interest and Engagement in Digitized Specimens

Participants' self-reported perspectives were well-aligned to findings from verbal utterances.

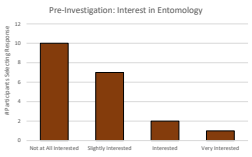
Participants reported that they found the specimens:

- Engaging (*M* = 5.4)
- Enjoyable to use (*M* = 4.7)
- Realistic looking (*M* = 5.3)
- Motivating in a science investigation (*M* = 5.3)
- Likely to inspire real world action (*M* = 4.6). I.e., to visit the museum to see specimens in person.

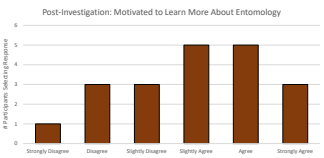


Working with Digitized Specimens Increases Reported Interest in Domain of Study

Before working with digitized specimens, **50% of participants reported they were "not at all interested"** in **entomology**.



After working with digitized specimens, **65% agreed they were motivated to learn more about entomology**.



Conclusions

- Digitized museum specimens inspire interest, engagement, and emotional reactions during science investigations.
- Students perceive digitized specimens to be realistic, enjoyable, and motivating for science learning and future museum visits.
- Conducting hands-on investigations with digitized specimens may inspire future interest and learning in science domains.

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