Project Summary

Aesthetics/Art in Geometry

Anna Dailey, ***CPM Teacher Research Corps*** *10.0, 2023-24* (See the full report)

Background

This study focuses on fostering aesthetic preferences of my students. The term "aesthetic" here goes beyond our everyday use of the word (i.e., visually appealing) and incorporates theories of what is valued, how it is valued, and why it is valued (Sinclair, 2009). If our goal is to widen access to mathematics (especially for students who have been underserved by traditional mathematics instruction), we must also seek to widen our perception of who can appreciate mathematics and in what ways. My own growing understanding of the gap between the aesthetic experiences of research mathematicians and students led me to the following primary research questions:

1. *How can I make space for students to cultivate an aesthetic appreciation for math?*
2. *How does fostering aesthetic appreciation impact students' conceptual understanding of mathematics content?*

Innovations

I share two innovations that supported the development of student-centric aesthetic preferences and aesthetic-driven conceptual understanding.These innovations include: 1) Contextualized Word Problem Diagrams and 2) Narrative Driven Flow Chart Proofs.

Findings

I initially thought a focus on aesthetics may make math more enjoyable for students. I also found it supported conceptual understanding in different ways than I anticipated. Before this study, I wanted students to find satisfaction in things similar to me, like finding satisfaction in taking a word problem and simplifying it to a single triangle. When I saw students incorporate the context of a word problem into their diagram (see innovation 1 above), I realized they were displaying an aesthetic preference different from mine. This was a great example of how students' aesthetic preferences, especially those that are different from my own, can aid their sense making.

Contribution

With many current curricular conversations centering on student choice, it is important to consider whether or not we have fostered within students the autonomy to make choices based on their own preferences rather than those of someone else (most likely their teacher). Mathematical aesthetics focus on what we value and how we value it provides teachers with an opportunity to cultivate within students more individual preferences and the autonomy to act on those preferences.

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