



Climate change is--is gonna destroy the planet if we don't do anything about it. Like, it's gonna be uninhabitable. I read somewhere that it's gonna be uninhabitable by, like, minimum 2090. I'm gonna be... if I live a long time, like, 90. But, like, if I were to live then, I don't want to be still dealing with climate change and live when the earth is uninhabitable. I mean, I don't, I don't think anybody else will want to. So that's why I think we should be an activist for climate change.
—Alfie, 5th grade student

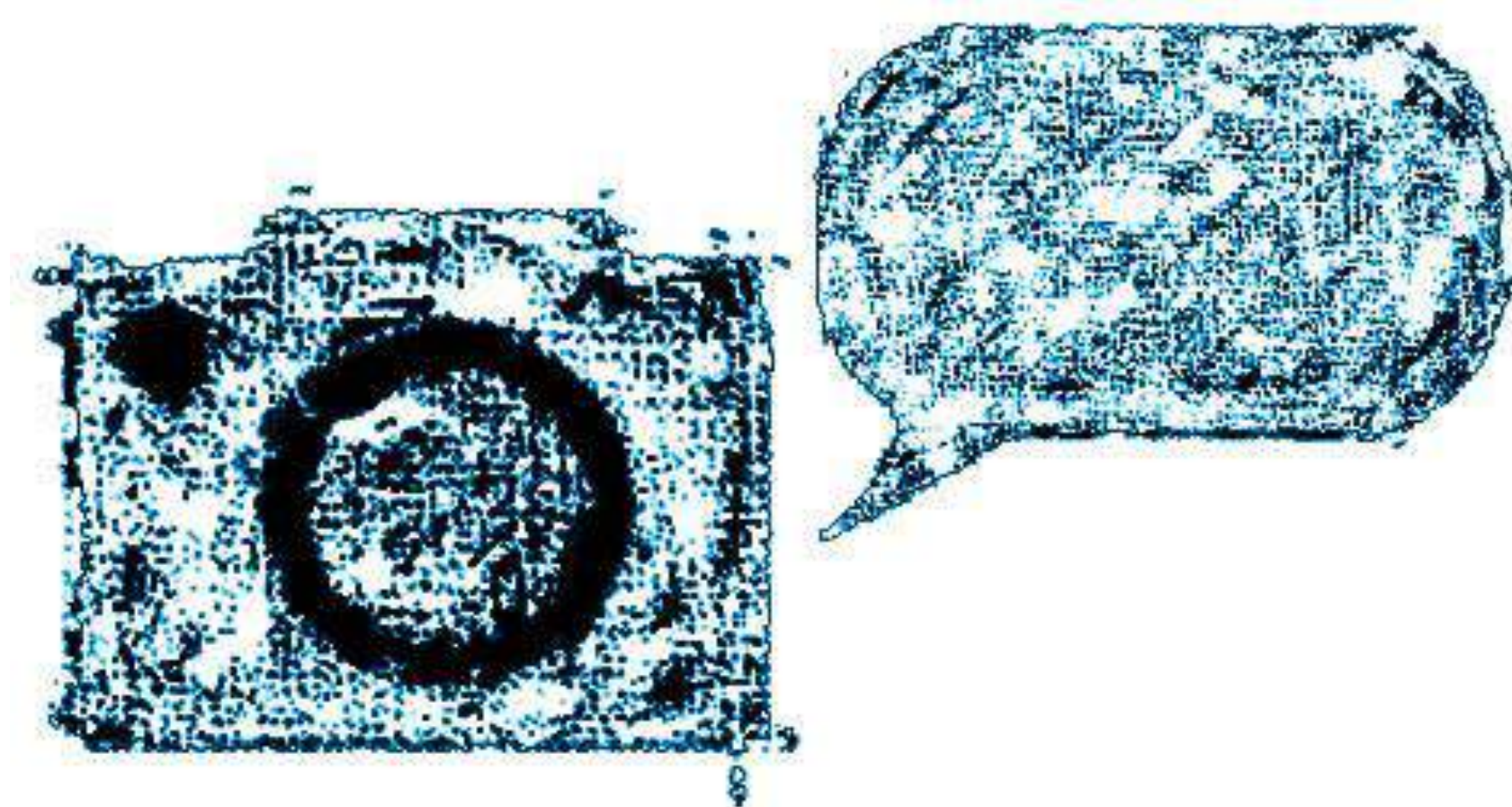


ABSTRACT

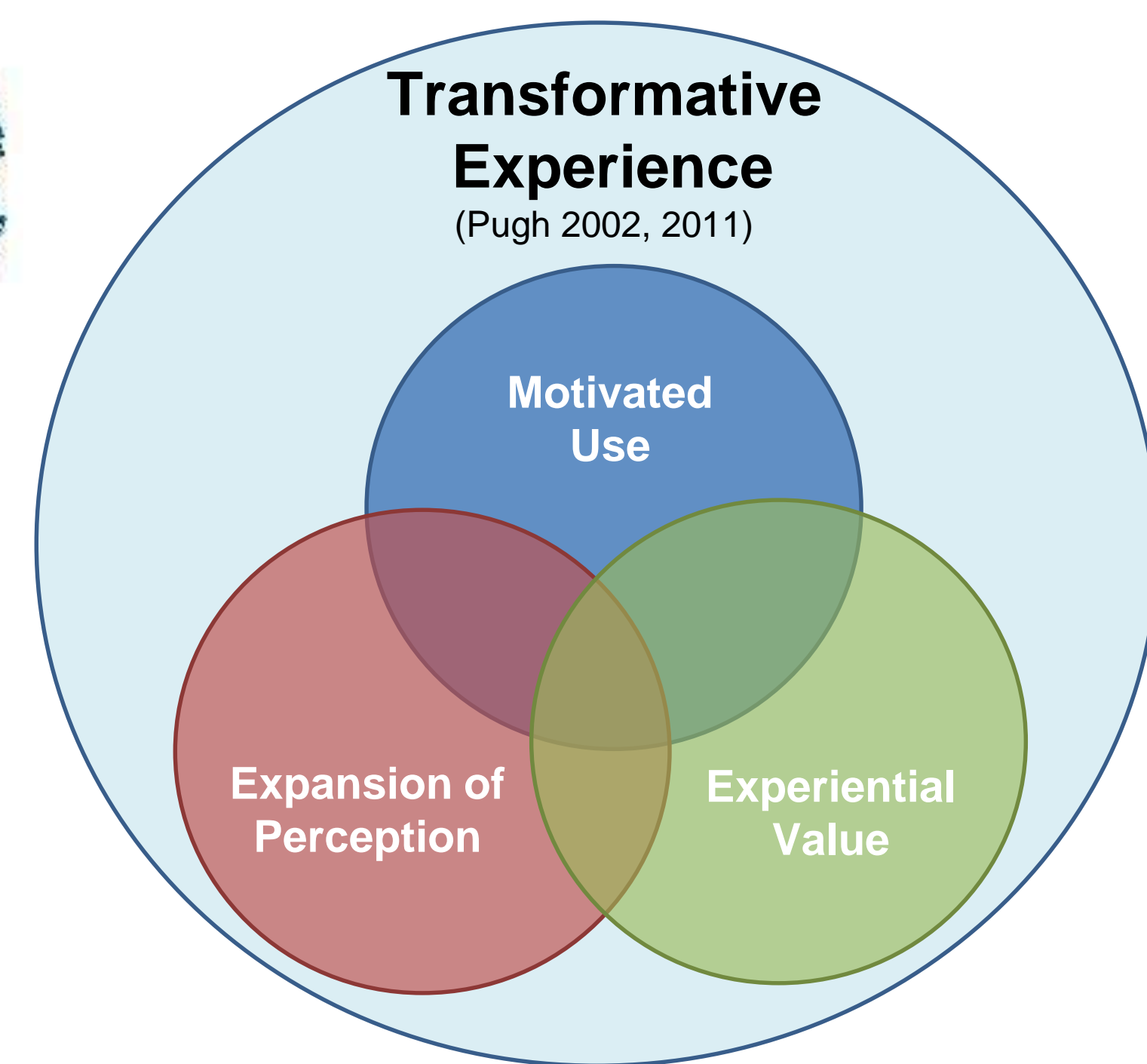
The largest Global Climate Strike in history was led and organized by youth. Students consider climate change a key issue impacting their futures. However, little is known about elementary students' climate change knowledge and experiences. We conducted a photovoice and transformative experience informed study with 22 fifth-graders. We explored how students understand climate change in their everyday lives and if engaging in photovoice offered students a transformative experience. We analyzed photos, interviews, group activities and a student survey using qualitative and quantitative techniques. Findings indicate students' photos represent a diverse range of local depictions and scientific explanations of climate change. In addition, results indicate that students had a transformative experience through participation in the photovoice unit.

BACKGROUND

- Environmental justice issues, such as the disproportional impacts of CC, promote feelings of fear and hopelessness in youth when the issues are not connected to one's place or context (Sobel, 1999).
- Science teachers typically incorporate CC topics from a global perspective (e.g., ice core data) and in sanitized ways that removes the experience of CC from students' daily life (Bang & Marin, 2015)
- Teachers need more options for practices that effectively tap personal relevance and utilize students' funds of knowledge in the classroom (e.g., Neri et al., 2019).



PHOTOVOICE allows youth to act as visual recorders of their communities to promote critical dialogue through reflection with their photos and peers (Wang & Burris, 1997)



STUDY CONTEXT

Participants:

- N=22 fifth-grade students
- 59% Male, 41% Female
- 70% Caucasian, 15% Asian, 15% two or more/other

Procedures:

- 8-week unit on Climate Change including: (a) photos, (b) SHOWed reflection (e.g. free-write with photos), (c) individual interviews, (d) group photo sorting activities, & (e) grand conversation

METHODOLOGY

RQ 1: How do students see, experience, and understand climate change in their everyday lives?

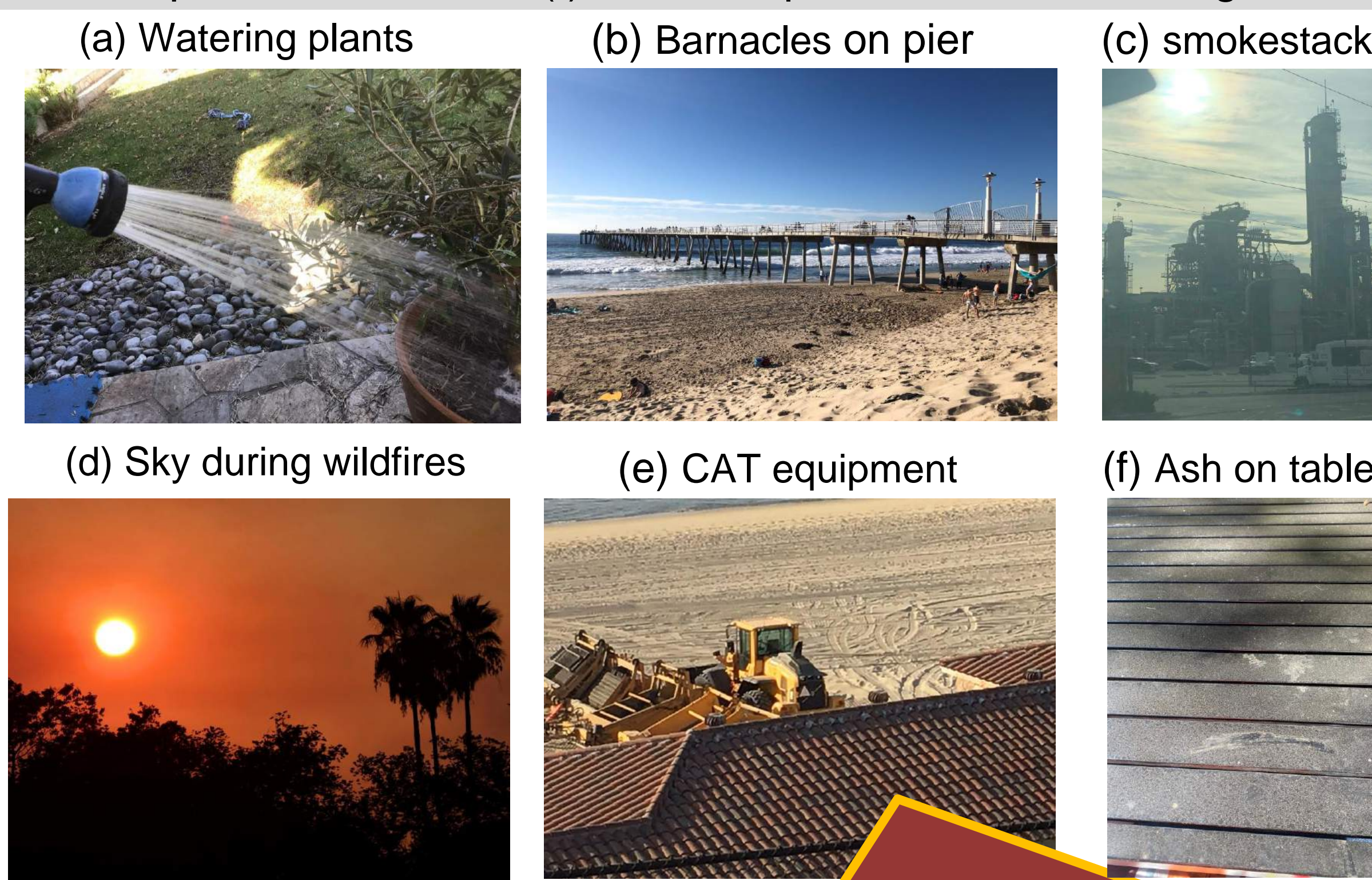
- **Data Sources:** (1) student photos, (2) SHOWed reflections, (3) student generated group sorting themes, and (4) individual student interviews
- **Data Analysis:** Thematic analysis using inductive coding (open and *in vivo*)

RQ 2: Does engaging in science learning through photovoice offer students a transformative experience (TE)?

- **Data Sources:** (1) individual interviews, (2) student presentations of group sorting activity, (3) grand conversation, and (4) survey items
- **Qualitative Analysis:** Structured & *a priori* coding using dimensions of TE (i.e. motivated use, experiential value, expansion of perception)
- **Quantitative Analysis:** Descriptive statistics of survey items

FINDINGS RESEARCH QUESTION 1

Representative photos by **theme**: (a) in my backyard, (b) around the ocean, (c) human built structures, (d) atmosphere and up above, (e) pollutive vehicles, (f) visible impacts of climate change.

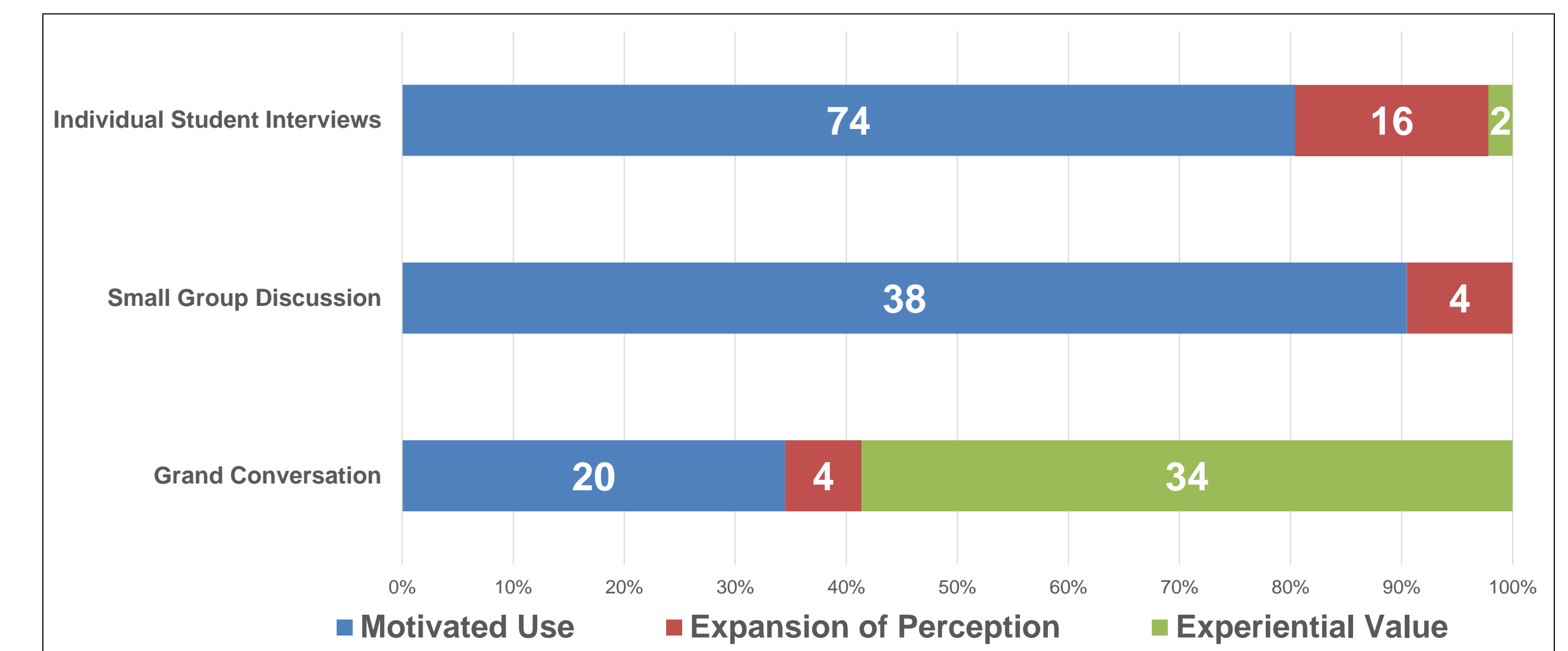


Student scientific explanation for how this photo represents climate change:

"When I was a kid, I didn't know anything about climate change. I thought that cars were, like good, and used on a daily basis, and I didn't know that they were running on gasoline... I didn't realize that they're running on gas, which-- comes from the ground, you know... fossil fuels which burning makes the greenhouse effect, which affects trees, But CAT is, I mean, like, the construction vehicle. It's, like, the same as a car. And I was just, like, reflecting that it was just about the same thing as a car. I had not thought of that before, that construction equipment runs on gas like cars."

FINDINGS RESEARCH QUESTION 2

Figure 1. Distribution of students verbal evidence they experienced a dimension of TE by raw coding count and percent.



Students experienced all three dimensions of TE during the activities. Across the activities we saw a difference in the distribution of these TE dimensions which can be seen in *Figure 1*. Further, post-survey data indicates the intervention fostered an overall TE for students which can be seen in *Table 1*.

Table 1.

Dimension and Corresponding Prompts	M	SD	Min	Max
Motivated Use	3.39	0.72	1	4
Expansion of Perception	3.03	0.72	1	4
Experiential Value	3.09	0.80	1	4
Overall Transformative Experience	3.17	0.76	1	4

SUMMARY

- Students' creating and sharing representations of CC in their communities helped them feel agency, raise awareness through activism, and create solutions for the climate change impacts they documented
- Students' experienced transfer during this intervention. The act of bringing their photos into the classroom facilitated new, personally relevant, co-constructed and generative ways of thinking about climate change that was then shared with others.