Poster Number

Design of Climate Change Proactive Adaptation Education

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1. Background & Problem

Climate change education (CCE) — centered on SDG 13 within the ESD framework — remains critically limited worldwide:

- 69% of Grade 9 curricula contain NO reference to climate change (McKenzie & Benavot, 2024)
- CCE is dominated by cognitive learning and skewed toward mitigation — leaving adaptation largely unaddressed (Bofferding & Kloser, 2015)
- The most transformative role for education — Adaptation Learning Support — is the least practiced (Feinstein & Mach, 2020)

2. The Three Realities of Climate Change

REALITY 1
Summers are becoming too hot
Rising mean temperatures · Dangerous heat days increasing · Reshaping agriculture, labor, and daily life

REALITY 2
Winters are no longer cold enough
Snowpack loss · Pest cycle disruption · Crop calendar shifts · Water availability changes

REALITY 3
Extreme weather events are increasing
More frequent floods, droughts, heatwaves, and storms · Compressed response timescales

PAE treats climate change as a GIVEN.
The question is not WHY —
but HOW DO WE LIVE WELL WITHIN IT?

3. Proposed Framework: PAE

Learning Object: People in Adaptive Action

Students investigate REAL ACTORS already navigating climate change:

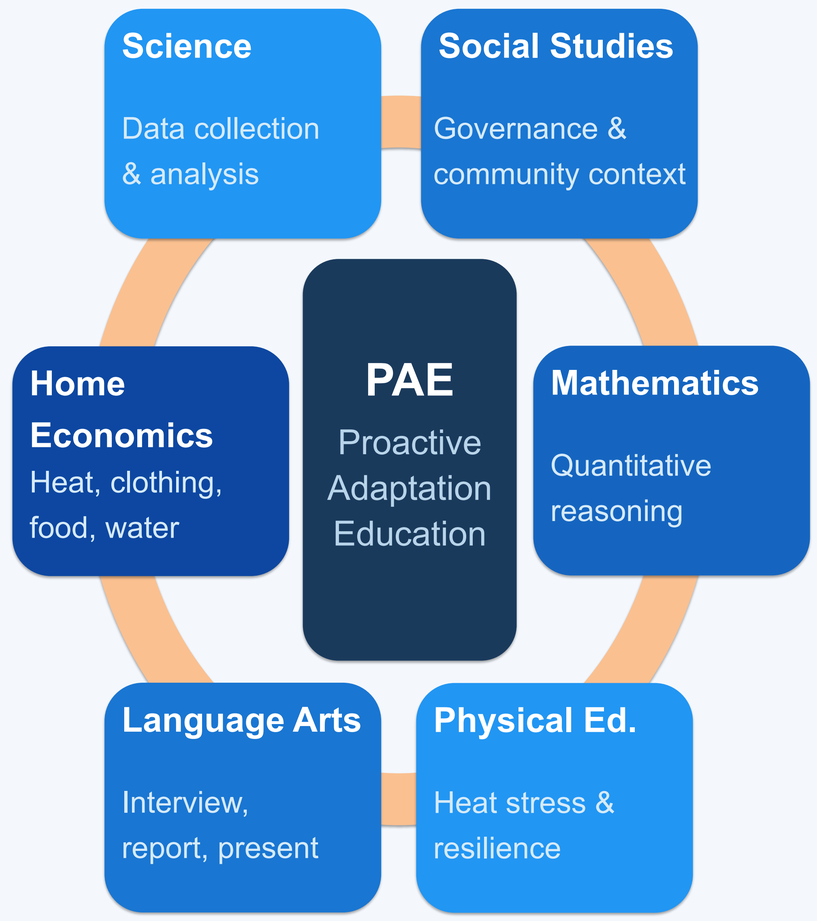
- Agricultural research stations developing heat-tolerant crops (10–15 year timescales)
- Fishers reading ocean data before deciding where to cast nets
- Engineers redesigning drainage for extreme rainfall
- Households adapting daily routines to manage heat

Inquiry Cycle

1. **Current Situation Analysis** — Local temperature records, seasonal shifts, extreme weather data
2. **Problem Identification** — Which crops struggle? Which fishing grounds shift?
3. **Solution Exploration** — Direct contact with practitioners in adaptive action
4. **Proposal & Trial** — Community presentations, letters to authorities, practical trials
5. **Result Analysis** — What works? What remains uncertain? New questions?

↺ *Iterative — students return to earlier stages as new evidence emerges*

4. Cross-Curricular Integration



5. Theoretical Grounding

Moore (2017)
Humans CAN learn proactively about climate change — education is the vehicle

Silici et al. (2021)
Bridging local + external knowledge enables adaptive capacity

Schrot et al. (2019, 2021)
Student-centered CCE measurably expands adaptation conceptions in adolescents

Feinstein & Mach (2020)
Adaptation Learning Support = most transformative, least practiced educational role

UNESCO (2023)
ESD pedagogy is “interactive and project-based” — PAE operationalizes this

6. Future Directions

Pilot Implementation

- Japanese middle school · Integrated Learning Time
- Small municipality pilot · Pre/post assessment
- Instrument: Schrot et al. (2019) questionnaire

International Collaboration

- School-to-school partnerships across climate regions
- Pre-service teacher education exchange programs
- Relational + cognitive learning across borders

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