BMKG

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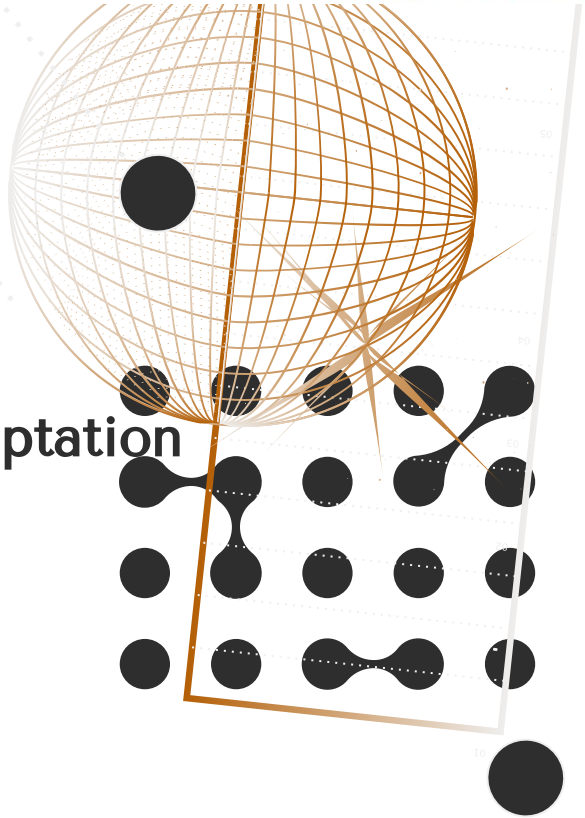
2025 CALMet XVI

CONECT
COLLABORATION AND LEARNING IN WEATHER, WATER AND CLIMATE

Consiglio Nazionale delle Ricerche
Istituto per la BioEconomia



Utilizing the Protégé Effect:

Training for Trainers Model for Disaster Mitigation and Climate Change Adaptation

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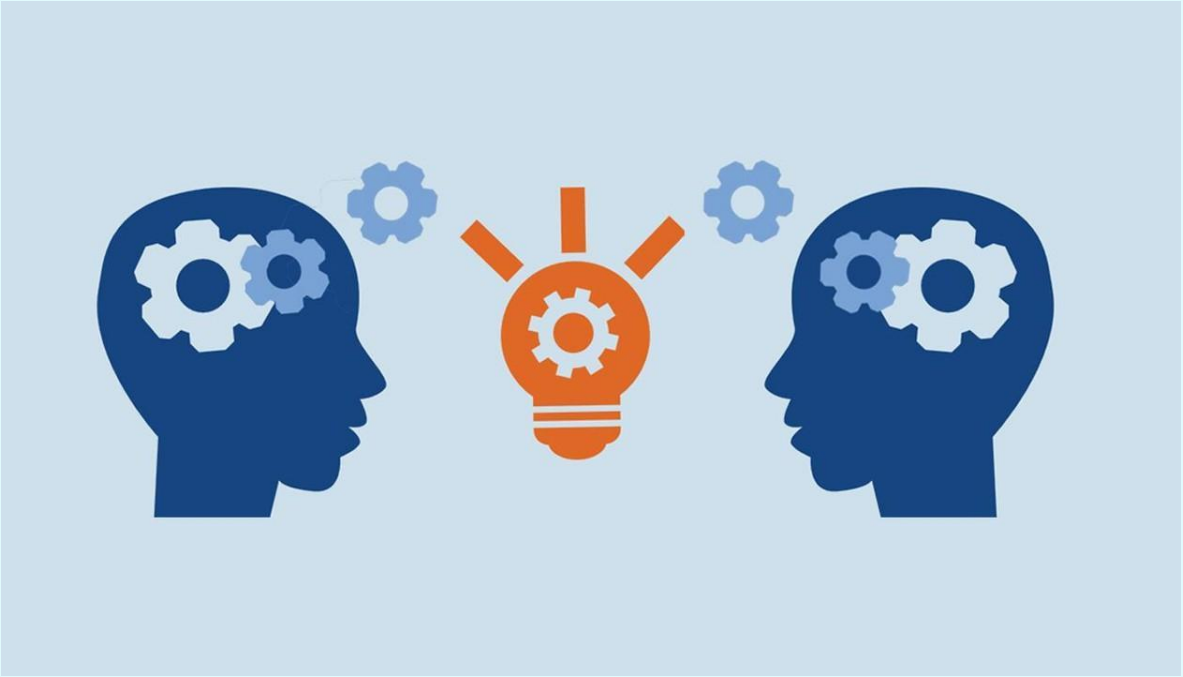
BACKGROUND

Environmental Context: Lombok is situated on the Ring of Fire, making it highly vulnerable to hydrometeorological disasters and climate change impacts

Pedagogical Issues: Conventional disaster education methods (one-way lectures) often fail to generate deep understanding or sustained behavioral change

Paradigm Shift: Moving students from being "passive objects" of protection to active "agents of change."

Pedagogical Validation: The necessity to empirically test the effectiveness of Peer-to-Peer methods (High School students teaching Elementary students) in the specific context of disaster mitigation.



- **“Docendo discimus”- We learn by teaching.**

~ Seneca

LITERATURE REVIEW

Theoretical Framework

Definition: A psychological phenomena where individuals learn material more effectively when they prepare to teach it to others.

Cognitive Mechanisms:
- ***Generative Processing:*** The reorganization of information to explain it cleary
- ***Social Accountability:*** A sense of responsibility toward the audience enhance learning motivative

Social Constructivism

Cognitive and Social Congruence: younger stufents often find explanations from peers more accessible due to shared language and equal social status

PROJECT DESIGN

- **Type:** *Quasi-Experimental Longitudinal Design*.
- **Location:** Selected schools in Lombok, West Nusa Tenggara.
- **Timing:** Early Even Semester 2026 (Strategically timed to avoid exam periods).

Participants

- **Population**: High School Students (Trainers) and Elementary Students (Learners).
- **Sample (SMA):** 30 Students.
    - *Experimental Group:* 15 Students (Selected to teach based on post-test scores).
    - *Control Group:* 15 Students (Receive training but do not teach).

Detailed Operational Timeline and Activities

No	Phase	Timing	Activity Description	Pedagogical Function & Analysis
1	Acquisition	Day 1 (08:30–12:00)	Lecture & Training: BMKG staff deliver core modules on weather, disaster mitigation, and climate adaptation to 30 high school students.	Input Phase: Establishing the "Prior Knowledge" base essential for the protégé effect.
2	Preparation	Day 1 (13:30–15:00)	Activity Formulation: All 30 students design teaching aids and games for elementary students.	Metacognitive Activation: This phase triggers the "Preparation Effect." Students organize knowledge for transmission.
3	Selection	Day 1 (15:00–16:00)	Post-Test: A written assessment determines the top 15 high school students who will proceed to the teaching phase.	Differentiation: Separation into Experimental (Trainers) and Control (Non-Trainers) groups based on performance.
4	Intervention	Day 2 (08:00–12:00)	Peer Teaching: The 15 Experimental Group students teach elementary classes in pairs. Control Group does not teach.	Active Learning: The core intervention. Trainers engage in generative processing and social accountability.
5	Reflection	Day 2 (13:30–15:30)	Games & Evaluation: Debriefing session for the trainers and learners.	Consolidation: Reflection helps cement the learning experience and allows for immediate feedback.
6	Assessment	+3 Months	Longitudinal Survey: Assessment of knowledge retention in both Experimental and Control groups.	Impact Measurement: Testing the hypothesis that teaching leads to better retention than training alone.

EXPECTED OUTCOMES

1. Cognitive Enhancement (Trainer)
Student teachers are predicted to exhibit superior long-term memory retention compared to non-teaching students (attributed to *The Preparation & Performance Effect*)

2. Pedagogical Effectiveness (Learner)
Higher levels of engagement are anticipated from elementary students due to the "relatability" factor of near-peer instructors

3. Social Impact
Multiplier Effect: Knowledge transmission from elemetary students to their parents (*Child-to-parent transmission*

DISCUSSION & CHALLENGES

Validity & Bias Issues

- **Selection Bias:** The Experimental Group is chosen based on high performance, making it difficult to distinguish the "teaching effect" from inherent aptitude.
    - *Recommendation:* Implement randomization of teaching assignments from the pool of qualified students.

Risk of Misinformation

- The potential for SMA students to convey incorrect safety protocols ("Telephone Game effect").
    - *Mitigation:* Strict adherence to the guide and direct supervision by teachers during sessions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THANKS

Any insight or questions?
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