

**AI-GEEM: A Systematic Protocol for Quantitative Affective Mapping of
Qualitative
Narratives Using Generative Artificial Intelligence Models**

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Introduction

The emotional landscape of school-based agricultural education (SBAE) teachers is complex, defined by highly emotional professional responsibilities, stress, and burnout (Traini et al., 2021). Our field's traditional qualitative methods often rely on verbal self-reports, struggling to access the pre-verbal, nuanced nature of these experiences. These direct-inquiry methods frequently fail to create the psychological safety required for teachers to share vulnerably (Hochschild, 2022; Kouamé & Feng, 2021). This methodological gap means our understanding remains superficial, often leading to interventions that target symptoms rather than primary causes. As a result, our interventions tend to be localized and temporary rather than systemic and responsive. This reality presents a methodological challenge: we need tools that can safely and authentically access the *space between* a teacher's validated feelings and their internal reality.

How it Works/The Innovation

We have successfully proposed and validated the AI-Generated Emotional Elicitation and Experiential Mapping (AI-GEEM) method as a new methodological tool designed to address this challenge. AI-GEEM innovates by using generative AI not as an analyst, but as a systematic translator, bridging the gap between unstructured qualitative data and auditable, quantitative affective science. It executes a proprietary, researcher-developed algorithm that translates a participant's narrative into a customized, theoretically grounded visual stimulus (image) for use in photo elicitation. To successfully activate the protocol, a modular three-pillar framework ensures accuracy: (1) *The Structural Pillar: Circumplex Model of Affect* (Russell, 1980) systematically assigns quantitative weights to the participants' captured vocal or text-based narrative and involves three steps: (a) first, key affective (including complex idioms, (e.g., "stolen tools")) are identified from the narrative. (b) the core component words of these phrases (e.g., "stolen tools") are matched to the Affective Norms for English Words (ANEW; Bradley & Lang, 1999) to retrieve their validated Valence (V) and Arousal (A) scores. (c) the individual V/A scores are averaged to create a single, auditable coordinate (e.g., V 4.89, A: 4.40) representing the narrative's core affective state. This final coordinate functions as a direct instruction to the generative AI, grounding the visual output in validated affective data. (2) *Ethical Pillar: Human-Computer Interface* (HCI; Nardi, 1998), ensures the *human-in-the-loop* and *faithful translator*, then synthesizes the quantitative weight (CMA coordinates) with the narratives' rich qualitative context. The context includes both its core metaphors and its overarching interpretive mood. This convergence ensures that the final prompt is an auditable co-creation, balancing the procedurally developed data with human meaning and understanding. (3) *The Interpretive Pillar (Modular)*: the framework's interpretive lens (e.g., self-determination theory; Deci & Ryan, 2013) is deliberately separated from the generation process. It is a modular component used only to analyze the "second layer" of data elicited by the final image. The most critical protocol of AI-GEEM is the *Participant Informed Prompt Approval* that validates the prompt with the participant *before* image generation, ensuring the process is trustworthy and participant-driven.

Results to Date

As a phase one demonstration, we conducted a researcher-driven proof of concept. AI-GEEM protocols and algorithmic programming successfully translated a published narrative of an SBAE teacher's *determined struggle* (Haddad et al., 2023) into a final, auditable prompt. This process resulted in a final, three-part synthesized prompt that balanced the systematic affective data (V: 4.89, A: 4.40) with the human-interpreted contextual metaphors (“lone teacher”, “neglected workshop”) and the narratives’ overarching stylistic mood (“tense, determined struggle”). The resulting image was shown to be a faithful translation of the prompt’s explicit criteria, validating the technical viability of the stimulus-generation protocol. This successful translation is a critical finding, as it demonstrates the protocol’s ability to procedurally synthesize and render three distinct data types: (1) quantitative (V/A coordinates), (2) qualitative-metaphorical (context), and (3) qualitative-interpretive (mood) into a single, cohesive, and theoretically grounded artifact. Deploying the AI-GEEM method in phase one trials demonstrated its use as more than a novel tool, offering a new analytic paradigm for agricultural education and the broader field of social science research, enabling analytic and technical advancements previously unattainable.

Future Planning/Advice to Others

As AI-GEEM is refined and further validated in Phase 2, human subject trials, future planning involves immediate analytic advances. This method extends beyond thematic analysis to create affective typologies that can map experiences, such as narratives of *burnout* versus *resilience*. The protocol uniquely allows for the quantitative longitudinal mapping of a participant’s emotional-affective (V/A) state over time. It also facilitates a true mixed-methods approach by systematically linking a second layer of qualitative data (participant reactions) to a quantitative V/A score, enabling rigorous integrated analysis. This protocol serves as a foundation for visionary, next-generation advancements. We anticipate holistic affective mapping, powered by next-generation AI platforms, which synthesize text, vocal inflection, and facial micro-expressions to capture pre-verbal data. Future iterations will also enable dynamic elicitation, moving to a live, interactive protocol where stimuli are co-created. The overarching goal is to develop predictive emotional modeling that identifies the affective tipping points preceding burnout, enabling data-driven and preventive measures. We anticipate that successful validation in Phase 2 trials will enable more advanced and reliable investigations in Phase 3, allowing AI-GEEM to expand and recursively react to the advanced models.

Costs/Resources Needed

The AI-GEEM method is designed for high accessibility and low-cost deployment. The primary resources required are: (1) a researcher trained in the ethical application and technical execution of the three-pillar protocol (CMA, HCI, and a chosen interpretive lens), (2) access to the ANEW lexicon (publicly available), (3) a commercial subscription to an advanced generative AI model (e.g., Midjourney base tier \$10.00/month), (4) standard qualitative data (transcripts), analysis software, and (5) institutional ethical review board (IRB) approval and adherence to relevant guidelines for AI and visual methods research. The method does not require dedicated servers or specialized computational hardware, ensuring high access with low monetary investment.

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