ECO-PASTELS: VALORIZATION OF DISUSED EDUCATIONAL BLACKBOARD CHALK FROM EARIST INTO PROFESSIONAL ARTIST-GRADE SOFT PASTELS FOR FINE ARTS CURRICULA

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Abstract

The global transition from analog blackboards to dry-erase whiteboards and digital interactive displays has left educational institutions with substantial stockpiles of unutilized blackboard chalk. Composed primarily of fine-grained calcium carbonate ($CaCO_3$) or calcium sulfate dihydrate ($CaSO_4 \cdot 2H_2O$), this material represents an underutilized, zero-cost mineral resource that often enters municipal waste streams. This study presents a circular economy framework for upcycling disused chalk collected from the Eulogio "Amang" Rodriguez Institute of Science and Technology (EARIST), College of Architecture and Fine Arts (CAFA) into professional artist-grade soft pastels ("Eco-Pastels") for fine arts studio programs. A diagnostic survey of N = 100 respondents within the EARIST Fine Arts community—comprising 7 Fine Arts professor /studio instructors and 93 undergraduate Visual Communication students—was conducted using purposive sampling to assess chalk disposal trends, studio material needs, financial expenditure, and performance priorities. A total yield of 8.0 kg of disused chalk was recovered directly from the department. Using micronized reclaimed chalk powder ($\leq 150\ \mu m$), organic binder (gum tragacant), earth pigments, and a plasticizer (glycerin), experimental pastel batches were synthesized and tested against commercial benchmarks. The optimized formulation ratio of 70 % reclaimed chalk base (5.60 kg total yield), 10% gum tragacanth binder (0.80 kg), and 20% pigment (1.60 kg) achieved superior tinting strength, buttery laydown, smooth blendability, and minimal dusting. Survey results revealed that 92.0% of participants strongly support implementing this upcycling protocol at EARIST. This research advances United Nations Sustainable Development Goals (SDGs 4, 12, and 13) by converting campus mineral waste into sustainable, high-value creative tools, thereby mitigating environmental impact while reducing student expenses on studio supplies.

Keywords: *Blackboard Chalk Upcycling; Circular Economy; Material Valorization; Soft Pastels; Visual Communication*