

Parametric design as a creative stimulus for leather artwork: An experiment of art education students

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Abstract

The current study explores connection between art, design and theories of mathematics through examining parametric patterns in nature, the mathematical algorithm used to create the patterns and apply parametric algorithms through leather artwork designs. The study presents the experiment which conducted with the Students in the Art Education program at the University of Nizwa, first semester/Fall 2025/2026, in the course "Artistic Crafts in Oman" (ARTE435), sections (1) and (2), first. The experiment aimed to develop innovative approaches among art and design students through creating leather artworks referencing natural parametric patterns. Before starting the project, the students learned about the geometry structures of nature, the various parametric patterns in nature in microorganisms, marine life, plants and insects. They acquired the skill of artistic leather techniques, such as embossing, pyrography/burning- painting/dyeing- engraving/stamping- perforation- we-modeling carving. The experiment included an analysis of selected parametric artworks specially in Oman. The significance lies in its potential to benefit students and academics by showcasing the experiment and producing parametric natural leather works compatible for marketing as art products in entrepreneurial projects. The study recommends conducting further artistic experiments with art and design students within the interdisciplinary field, integrating art with biology and natural engineering. and further developing the experiment by incorporating digital applications and artificial intelligence. The results demonstrated that such approaches, integrating art with mathematics theories, enriches students' creative thinking and their production, students' artworks can be utilized in micro-entrepreneurship projects. The study utilized experimental development methodology to examine hypotheses and validate findings.

Keywords: Art Education; Entrepreneurship; Interdisciplinary; Leather Artistic Techniques; Parametric Patterns