

Title	デザイン教育における知識変換と創造的思考: 意味的刺激に関する研究
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# Abstract

Within the context of a knowledge-based society, design education is increasingly expected to cultivate creative thinking while simultaneously responding to broader cultural, technological, and social challenges. Contemporary design practice has moved beyond the simple transmission of skills or stylistic knowledge and now functions as a critical medium for artistic innovation, cultural continuity, and social value creation. However, despite long-standing recognition of creativity as a core educational objective, design education still faces persistent difficulties in systematically supporting creative thinking, particularly with regard to how semantic stimulation is conceptualized, structured, and operationalized within teaching and learning processes.

Against this backdrop, this research, *Knowledge Transformation and Creative Thinking in Design Education: A Study on the Semantic Stimulation*, adopts an interdisciplinary perspective that integrates theories from knowledge science, cognitive psychology, and design studies. Focusing on the interaction between learners and knowledge, the study investigates how semantic stimuli function as a mediating process that supports knowledge transformation and creative thinking. By examining semantic stimulation as an instructional intervention rather than as incidental teaching content, the research aims to clarify how design education can foster creative cognition through the coordinated integration of science, technology, and art, thereby constructing a more rational and sustainable educational pathway for design innovation.

The study centers on the theme of “the promotion of semantic stimulation in fostering creativity in art and design education.” An intervention-based experimental design was implemented using expert commentary vocabulary as semantic stimuli, with creativity evaluation metrics reconfigured from traditional outcome-oriented assessment tools into process-oriented cognitive guides applied at the early stages of design ideation. Through a mixed-methods research framework combining quantitative analysis and qualitative inquiry, the study systematically examines the effects of different semantic categories, the proactive use of evaluation metrics, and individual learner differences on creative idea generation in design tasks.

The findings demonstrate that semantic stimulation plays a substantive role in enhancing learners' creative thinking in design education. Both abstract and concrete semantic words were shown to effectively activate divergent associations and support ideation, albeit in different ways. Abstract semantic stimuli primarily facilitated conceptual expansion, originality, and aesthetic exploration, while concrete semantic stimuli supported structural clarity, functional reasoning, and practical feasibility. Moreover, the application of creativity evaluation metrics during the early conceptual design phase was found to positively guide learners' cognitive processes, enabling them to align creative exploration with evaluative dimensions such as originality, aesthetics, structure, and functionality from the outset of the design process. The results further indicate that individual factors, including education level and professional background, significantly influence learners' preferences for semantic stimuli and their creative performance, highlighting the need for differentiated instructional strategies in design education.

By examining the dynamic relationship between knowledge transformation and creative thinking, this research proposes a knowledge transformation model grounded in semantic stimulation. The study conceptualizes creative thinking as an emergent capability that develops through continuous cycles of interpretation, externalization, integration, and internalization of knowledge, rather than as an innate or spontaneous talent. Theoretically, the research introduces knowledge transformation as a central analytical lens for design education, contributing to the construction of an integrated educational framework that bridges science, technology, and art. Practically, it offers concrete pedagogical strategies and research methods that support the reciprocal development of creative expression and design innovation. Through these contributions, the study seeks to align design education more closely with the demands of social innovation, cultural preservation, and sustainable creative development in contemporary society.

**Keywords:** design education, knowledge transformation, creative thinking, semantic stimulation, tacit and explicit knowledge, creative cognition