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MULTIMODAL LEARNING AS A NUDGE, AN EMPIRICAL STUDY OF JAPANESE TASK-BASED LESSONS USING STEAM TOYS

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Abstract

This study examines the impact of a task-based lesson using STEAM (Science, Technology, Engineering, Arts, Mathematics) toy assembly with Japanese instructions, compared to a conventional (lecture-based) Japanese lesson, on learners' affective responses, comprehension, perceived expression gains and collaboration. Because STEAM toys involve manual operation, visual information, trial and error, and collaboration, they can be understood as embodying multiple elements of 'nudges' from behavioural science (EAST/MINDSPACE) and may naturally guide learning behaviour. The participants included 49 third- and fourth-year students majoring in Business Japanese at Chandrakasem Rajabhat University in Thailand. An interim and final questionnaire were administered using a pseudo-

randomized crossover design to control for lesson-order effects. The results showed that the STEAM toy lesson received higher ratings than the conventional lesson in 'enjoyment', 'interest' and 'collaboration', confirming its function as a 'nudge' that enhances learners' motivation. In contrast, 'perceived expression gains' were higher in the conventional lesson. This suggests that the limited vocabulary range of the instruction manual and the cognitive load associated with task execution may have made it difficult for learners to consciously notice their use of Japanese. Furthermore, there was no difference between the two lesson formats in perceived 'ease of comprehension', yielding the unexpected finding that multimodal elements (language × visuals × bodily manipulation) can alleviate cognitive load and that task-based learning does not necessarily make comprehension more difficult. In the final questionnaire, the differences between the two formats disappeared, suggesting that the task-based and conventional formats may function complementarily. This study is significant in that it integrates the frameworks of nudge theory, task-based language teaching and multimodal learning and provides the first empirical evidence that task-based lessons using STEAM toys can be effective in language education. Future tasks will include measuring objective learning outcomes, optimizing materials, examining long-term effects and conducting cross-cultural comparative studies, with the aim of further developing hands-on models for Japanese language education.

Keywords:
STEAM Toys, Task-Based Learning, Nudge Theory, Learner Motivation, Japanese Language Education