



## Structure of Consciousness in Reflection on Production Activities: Project Study in Japanese Technical High Schools

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### ABSTRACT

The purpose of this study was to examine the structure of consciousness in technical high school students' reflection after the completion of a project study regarding production activities of design-and-make products. The project study was one of the courses in technical high schools in Japan. A survey was conducted on 689 12th graders in Japanese technical high schools. But only 83.5% (575 students) of the respondents returned the valid questionnaires. The study used Shimada et al. (2006) and Kanda and Matsuura (1999) models as the underpinning framework to conceptualize the study. Derived from Shimada et al. (2006), eight categories of students' consciousness were included: (a) the acquisition knowledge and skills, (b) patience and efforts, (c) cooperation and teamwork, (d) accomplishment of *monozukuri*, (e) planning, (f) enjoyment of *monozukuri*, (g) independence, and (h) reflection were the bases for developing the instrument. In addition, based on Kanda and Matsuura's model, five factors were adopted for the study. The factors were consciousness, safety, values, learning, and self-assessment. The key results showed that the structure of consciousness in students' reflection on the production activities in a project study in Japanese technical high schools was affected by the three main factors – consciousness, values, and safety. In addition, the findings also revealed that effective teaching strategies should be designed for certain types of students that were involved in this study. Based on the data, the structure of consciousness is dependent on the goals and contents for production activities and the engagement of the students. In sum, having a bird's-eye view toward the results, validity of the model created in the present study was verified.

**Keywords:** Structure of consciousness, technical high school students, project study, factor analysis, Japan