

# Enhancing Spatial Ability Skills in Basic Engineering Drawing Using a 3D Solid Model.

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- **Abstract:** Spatial ability skills are an important component of an engineer's ability to create and interpret engineering drawings, which involves thinking and problem-solving processes. The ability of an engineer to visualize 3D image is a cognitive skill that is essential to succeed in basic engineering drawing subjects. Based on previous literature and preliminary study, engineering technology students with poor spatial ability skills had challenges in understanding basic engineering drawing topics. Hence, this study is aiming at enhancing spatial ability skills using a 3D solid model among first-year engineering and technology education students. The quasi-Experimental research design was adopted for this study. A targeted class of 43 first-year technology education students who are in the first semester was used for the study. The students were divided into control and experimental groups respectively. A pre and post-test were used to collect data from the students to measure their level of spatial ability skills enhancement. However, after the treatment using a 3D solid model, the experimental group had a higher performance than the control group likewise the students with non-engineering background in the experimental group performed above average. The results indicate that a solid 3D model was effective for improving spatial ability skills among first-year technology education students. This study implies to educators that there is a need to appropriately enforce the use of a 3D solid model for effective teaching and learning of basic engineering drawing. It is, therefore, affirmed that the use of a 3D solid model in teaching basic engineering drawings should be enhanced with other teaching methods.
- **Keywords:** quasi-Experimental, spatial ability skills, engineering drawing, 3D solid model