

THE EFFECTIVENESS OF LEARNING TO REPRESENT PHYSICS CONCEPT APPROACH: PREPARING PRE-SERVICE PHYSICS TEACHERS TO BE GOOD TEACHERS

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ABSTRACT

Determining what to teach to pre-service teachers, how to teach it, and what skills they should have, should refer to empirical facts. The research aimed to measure the effectiveness of the design of learning to represent physics concepts in improving the ability of pre-service physics teachers to make translation among representational modes and make multiple representations of physics concepts. This instructional approach design is embedded in the physics subjects with selected topics. Research outcomes showed that the approach had a high significance in improving the ability of making multiple representations of concept and translating among modes of representation for the domains of waves and optics and electromagnetism.

The pre-service physics teacher's abilities in making multiple representations of physics concepts and translating among representational modes improved with average normalized gains in the criteria of low to moderate. Their ability in making multiple representations of physics concepts could be explained for 37% by the ability in making translation among types of representational modes through linear relationship with the formulation of $X = 6.77 + 0.33Y$. Based on the interview with the pre-service teachers, another factor was found to influence the ability of making multiple representations, namely their ability of understanding physics concepts and the domain of the concepts to be represented.

KEYWORDS: Learning to Represent Physics Concepts, Pre-Service Teacher, Effectiveness of Learning Approach, Multiple Representations, Translation among Representational Modes