8 - Scientific Literacy and Socio-scientific Issues | Empirical

SP - (16349) - EPISTEMOLOGICAL VIEWS ON SCIENCE AND SEVENTH GRADERS' SCIENTIFIC EXPLANATIONS OF GLOBAL WARMING

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Short Abstract

This study re-examines the relations between students' scientific epistemological views and their learning of scientific explanation in a more culture- or standpoint-diverse context, particularly global warming. Seventh graders (n=106) from northern Taiwan were engaged in carefully designed sequenced units that facilitate numerical literacy, data interpretation, developing scientific explanations, and applying scientific explanations in near transfer contexts. Their scientific epistemological views were assessed using Tsai and Liu's (2005) instrument. Based on previous literature and our preliminary correlation analysis, a hypothetical model was built. Variables in the Scientific Epistemological Views survey and scores of the key units, numerical literacy and data interpretation, were used to predict the effectiveness of immediate learning outcomes as scores of learning and transferring scientific explanations. The partial least squares structural equation modeling technique was used to verify the designed model.

The results were surprising. Unlike previous studies, the role of Theory-Laden exploration and numerical literacy was unobserved, whereas the cultural impacts showed a substantial role in predicting the performance of generating scientific explanations in the learning and transferring stages. The results deviated from previous studies, suggesting that the relationships between scientific epistemological views and the generation of scientific explanations may be context-dependent. Our findings have implications for equipping future citizens with the ability to generate adequate explanations or critically evaluate alternative claims on emerging issues such as climate change.