Influences on interest in climate change and forests

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Abstract

This poster presents a path model predicting seventh-grade students' desire to learn about climate change and forests before and after an educational intervention on these topics. It includes discussion of both the predictive factors and the model development process.

Interest is an important predictor of behaviors (Deci 1992, Fröhlich, Sellman and Bogner 2013, Uitto and Saloranta 2010). For example, interest in science can predict science achievement (Osborne, Simon and Collins 2003, Tyler-Wood, et al. 2012) and the pursuit of science careers (DeWitt, et al. 2013, Lamb, et al. 2012, OECD 2008, Tyler-Wood, et al. 2012). While many studies have investigated the role of interest in within general science learning contexts (Osborne, Simon and Collins 2003, Potvin and Hasni 2014, Lin, et al. 2013, Tapola, Veermans and Niemivirta 2013, Tuan, Chin and Shieh 2005), few have examined students' interest in climate change (Dijkstra and Goedhart 2012, Strømsø, Bråten and Britt 2010, Uitto and Saloranta 2010) or how to enhance it.

This poster presents a path model of the causal chain predicting student interest in climate change and forests. Our path model is based on data collected through two questionnaires distributed to 348 seventh-grade students. These data were collected before and after participating in a multi-day curriculum about the impacts of climate change on forests based on mathematical modeling (Zint, et al. 2014).

Exploratory factor analysis confirmed the existence of five hypothesized factors related to student interest in climate change and forests. These factors were Overall Science Engagement, Interest in Scientific Inquiry, Perception of Climate Change Risk, Interest in Climate and Forests, and Desire to Learn about Climate and Forests. We selected Desire to Learn about Climate and Forests as our dependent variable as it is most likely to serve as an indicator of continued learning about these topics (Hidi and Renninger 2006).

Initial analysis included paired t-tests, multiple linear regressions, and hierarchical linear modeling. After controlling for teacher effects, our analysis identified no changes between the pre-test and post-test scores on any of these factors. Our path model was therefore not designed to reveal changes from the intervention but to reveal the causal chain of factors that affect Desire to Learn. The path analysis revealed that Science Engagement and Interest in Inquiry had significantly higher direct and indirect effects on Interest and Desire to Learn than did Perception of Climate Change Risk. It also showed that Interest is predictive of Desire to Learn, and the effects of interest on desire to learn were significantly smaller after the educational intervention.

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October 7, 2014

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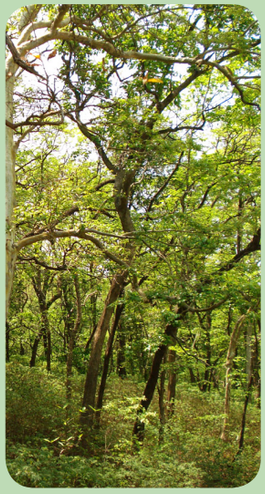
Study Description

- Eight-day curriculum taught in seventh-grade science classrooms
- Topics include climate change, forest adaptations to climate, and predicted effects of climate change on forests
- Activities include building scientific models of tree growth and a field trip to a local forest to take tree measurements



Research Objectives

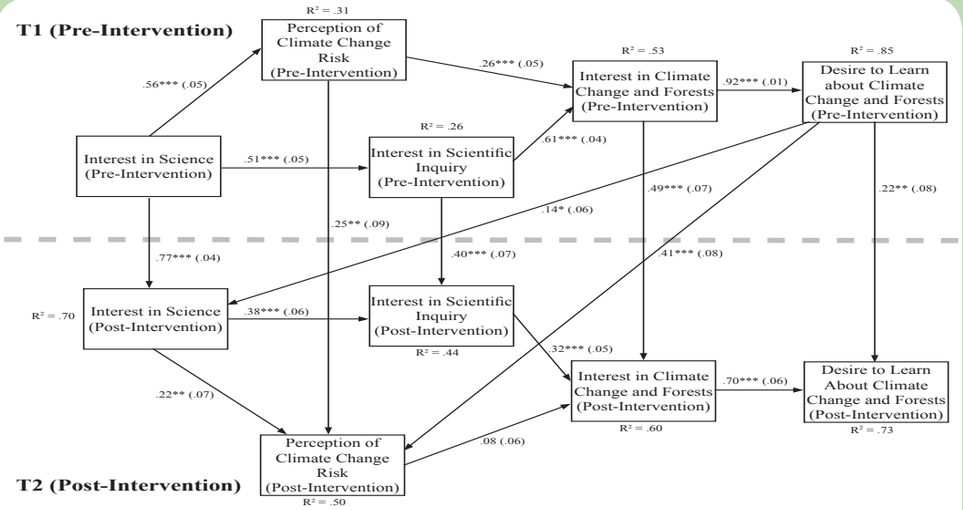
- Determine: (1) how much the educational intervention changed students' interest in climate change and forests as well as related factors, and (2) what factors predict students' interest and desire to learn about climate change and forests
- Provide theoretical and practical insights into fostering middle school students' interest in and desire to learn about climate change.

Research Methods

- Five teachers and 348 students participated
- Students took pre- and post-intervention questionnaires with Likert-type scales (1-5 measures of agreement)
- Analysis included exploratory factor analysis, multilevel modeling, and path modeling

Key Findings

- Perception of climate change risk had moderate effects on student interest in climate change pre-intervention, but no effects post-intervention
- Interest in science and scientific inquiry had strong effects on interest in climate and forests both before and after intervention
- Desire to learn about climate and forests pre-intervention had large effects on post-intervention perception of climate change risk



Final Path Model

Conclusions

- Science and inquiry activities are more effective ways to get students interested in climate change topics than focusing on climate change risks.
- Students with a greater desire to learn about climate change and forests before the intervention were more likely to increase their perception of climate change risk afterward.
- Interest in climate change is not the same as desire to learn about it. Students maintain interest in climate change and forests, but they do not necessarily want to learn *more* about it after the intervention.

Future Research

Research for the 2013-2014 and 2014-2015 years will look at the effects of specific activities and the role of interest in achievement.

This research was funded by a USDA McIntire-Stennis Forestry Research Grant as well as National Science Foundation CAREER grant. We gratefully acknolwedge the help of Dr. Ines Ibáñez, Meghan Kelly and Linda Isakson in preparing the curriculum content and study questionnaire.

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