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OPEN-ENDED SURVEYS IN THE GEOSCIENCE CLASSROOM: EFFECT OF DISCUSSION GROUPS TARGETING STUDENT'S PRIOR KNOWLEDGE

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One of the factors affecting students' learning in geoscience is their existing knowledge prior to instruction. Accessing prior knowledge reveals both scientific and non-scientific conceptions held by students. This study is concerned with students' alternative conceptions and the pedagogical strategies, especially the use of discussion groups, used to change these conceptions. Five surveys were conducted within a course addressing the geological history of global change (http://www.indiana.edu/~g302/home.html). Questions were open-ended and designed to elicit students' prior knowledge of selected topics, including extraterrestrial environments and life, formation of the moon, growth of continents, the Gaia hypothesis, and the biogeochemical history of the Earth. Surveys were collected prior to the in-class group discussions of these topics. Responses indicated that students hold a number of alternative conceptions of the topics (e.g. the moon formed as a result of a collection of dust and particles in space). The variety of responses also differed among individual topics. Accessing prior knowledge and the subsequent use of discussion groups to make topics intelligible to students is consistent with conceptual change models suggested by science educators. Furthermore, knowledge of such specific alternative conceptions has implications for teaching geoscience courses. The use of surveys, conducted prior to discussion in the geoscience classroom, combined with the outcome of the discussion sessions facilitates instructor responses that optimally target critical learning objectives. Pursuit of this strategy leads to the development of better pedagogical practices that promote conceptual change.

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