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Impact of instruction on development of scientific reasoning

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Scientific reasoning is an important ability in learning. A recent study will be presented that compared the reasoning abilities of Chinese and U.S. college students who experienced vastly different pre-college physics curriculum. The results of the study showed that regardless of prior physics preparation, both groups performed similarly on Lawson's Classroom Test of Scientific Reasoning. The implication is that reasoning must be directly addressed in classroom teaching. The talk will also include a description of a new course at Wright State which was originally implemented to increase retention of "not-yet-ready" science majors. The course framework is guided by a set of scientific reasoning and mathematical skills, and the curriculum employs explicit scientific reasoning training. Skills developed early on are repeatedly practiced in other multidisciplinary science contexts throughout the course. Evaluation of the curriculum indicates that student reasoning significantly improves. Student retention data and next steps including incorporating the curriculum in courses at other high schools and colleges will be discussed.