

## **A Model for Effective Professional Development of Formal Science Educators**

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The Lunar Workshops for Educators (LWE) series was developed by the Lunar Reconnaissance Orbiter (LRO) education team in 2010 to provide professional development on lunar science and exploration concepts for grades 6–9 science teachers. Over 300 educators have been trained to date. The LWE model incorporates best practices from pedagogical research of science education, thoughtful integration of scientists and engineer subject matter experts for both content presentations and informal networking with educators, access to NASA-unique facilities, hands-on and data-rich activities aligned with education standards, exposure to the practice of science, tools for addressing common misconceptions, follow-up with participants, and extensive evaluation. Evaluation of the LWE model via pre- and post-assessments, daily workshop surveys, and follow-up surveys at 6-month and 1-year intervals indicate that the LWE are extremely effective in increasing educators' content knowledge, confidence in incorporating content into the classroom, understanding of the practice of science, and ability to address common student misconceptions.

In order to address the efficacy of the LWE model for other science content areas, the Dynamic Response of Environments at Asteroids, the Moon, and moons of Mars (DREAM2) education team, funded by NASA's Solar System Exploration Research Virtual Institute, developed and ran a pilot workshop called Dream2Explore at NASA's Goddard Space Flight Center in June, 2015. Dream2Explore utilized the LWE model, but incorporated content related to the science and exploration of asteroids and the moons of Mars. Evaluation results indicate that the LWE model was effectively used for educator professional development on non-lunar content. We will present more detail on the LWE model, evaluation results from the Dream2Explore pilot workshop, and suggestions for the application of the model with other science content for robust educator professional development.