Paper ID: 40626
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SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
Lift Off - Secondary Space Education (1) (2A)

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IMPACT OF HANDS-ON PROFESSIONAL DEVELOPMENT WORKSHOP IN NORTH DAKOTA ON SECONDARY TEACHER CONFIDENCE IN SPACE SCIENCES

Abstract

It is not uncommon for both teachers and students to hold the same misconceptions regarding space sciences. K-12 educators report low levels of confidence in teaching STEM (Science, Technology, Engineering, and Mathematics) and feel isolated in their communities, especially in rural settings, such as North Dakota. Often, teachers in rural areas may be the only science teacher in their school or entire school district. Teachers' overall low levels of proficiency regarding space science curricula suggest that more educator workshops are necessary to ensure that K-12 students are receiving the most effective instruction possible. Teachers' avoidance of space science topics can be attributed to the lack of confidence in the subject matter and limited access to resources.

The proposed 15-hour educator workshop for in-service teachers will take place in May of 2017, at the University of North Dakota in Grand Forks, ND. Teachers will receive one professional development credit for participation. The workshop will include hands-on activities in the space sciences and NASA resources, with a focus on the engineering design process and the Next Generation Science Standards (NGSS).

Workshop participants will include secondary teachers from across North Dakota, with travel supported by the NASA North Dakota Space Grant Consortium. Approximately 20 teachers will be participating in the workshop. Conclusions drawn from this research will be limited in scope, because these workshop participants will likely consist of motivated teachers who want to improve their space-relevant knowledge and teaching strategies. This is not necessarily a representative population of all secondary science teachers in ND.

Participants will be given pre- and post-surveys to assess their levels of confidence, anxiety, inclusivity, and competence in STEM and space sciences. They will take the post-surveys immediately following the workshop, and once more following the conclusion of the 2016-2017 academic year. Surveys will include both Likert-style and open response questions. Survey results will be examined to determine any statistically significant changes in the aforementioned areas.

It is expected that the workshop will serve to increase educators' confidence in teaching STEM pedagogies. The workshop will provide teachers access to new resources, decrease STEM anxiety, and provide them with a network of colleagues who are facing similar challenges as a science educator in rural areas.