



Making Sense of SCIENCE

MOVING THE NEEDLE ON MIDDLE SCHOOL STUDENT ACHIEVEMENT IN SCIENCE BY STRENGTHENING TEACHERS' KNOWLEDGE & SKILLS

In a series of increasingly rigorous quasi-experimental and experimental studies of Making Sense of SCIENCE (MSS), statistically significant differences were found in each study favoring treatment teachers and students on measures of science content knowledge. The most recently-completed study evaluated the efficacy of three Making sense of SCIENCE (MSS) courses — Matter, Energy, and Force & Motion. Study results corroborated the National Academies of Sciences report, *Science Teachers' Learning: Enhancing Opportunities, Creating Supportive Contexts* (2016) in which Making Sense of SCIENCE was named as one of a few model programs nationally.

Study Overview

The study examined the effectiveness of these three courses in strengthening teachers' knowledge for teaching those science domains, along with measuring the effect on students' achievement in physical science and in science overall, as measured by the Arizona state standardized test (AIMS). The study involved 70 middle school teachers from 62 schools in 11, Phoenix-area districts reaching 21,000 students. Schools were randomly assigned into treatment and control groups. Teachers at schools in the treatment group were eligible to participate

in the three MSS professional learning courses. Teachers at control schools were eligible to take the courses after two years. The target population was grade 8 science teachers and their students, as this is the grade level when physical science is taught to middle school students in Arizona and when the students take a state standardized test to assess their physical science knowledge. Outcomes were measured for teachers and students in two of each teacher's classes during both the 2012–13 and 2013–14 school years.

Promising Findings

- By the end of the study, students of teachers who had taken MSS courses had gained the equivalent of nearly 6 additional months of learning, based on a 9-month school year, compared with students in control classrooms.
- Statistically significant and substantial positive effects were found on teachers' content knowledge in physical science, both at the end of the first year of the training, and at the end of the full two years.
- The majority of teachers rated the professional learning as *among the best or better than the average* professional learning experience of their career.

For a more complete summary of this research, please contact us:
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