The nature and impact of elementary school teacher partnerships with university scientists

Jeremy A. Spoola,c and Dorothea A. Ledinb
University of Wisconsin – Madison; Department of a Zoology, b WISCIENCE; c Delta Teaching and Learning Internship
spool@wisc.edu

Background

- On average, elementary school teachers have little training and low confidence in teaching inquiry-based science (Avery, 2012).
- There is little time for science in elementary schools (1-2 hours a week on average; Trygstad et al., 2013).
- Scientist-teacher partnerships can improve inquiry based science instruction in K-12 schools (Gamele et al., 2010).
- However, it is unknown how effective these partnerships are when funding and time are limited.

Program description

- Young Science Scholars pairs science and engineering students from UW Madison (mostly graduate students) with elementary school teachers in the Madison Metropolitan School District.
- UW partner teaches one science lesson per week in the teacher's classroom.
- Partners were allowed to choose what roles they would take in the partnership.

Questions

1) Do partnerships increase teacher self-confidence in science teaching?
2) What are the roles that teachers and UW partners take in these partnerships?

Study Design

- Surveys – asked teachers to self-report confidence; asked teachers and UW partners to describe partnership roles
  - Cronbach’s alpha was used to ensure that all survey questions addressed a single construct (acceptable range: 0.7-0.9; Rickards et al., 2012).
  - CATMA online software was used to code responses to open-ended survey questions (Computer Aided Textual Markup & Analysis online tool; http://catma.de/home).
- Classroom observations – COPUS style of classroom observations was used to observe partnerships (Smith et al., 2013).

Without explicit instructions for partnership roles, partners reported that scientific lessons were co-taught, that UW partners acted as scientific role models, and teachers provided classroom expertise.

- Teachers self-reported significant gains in self-confidence in science teaching.
  - Cronbach’s alpha: 0.74
  - Wilcoxon Rank-sum test – is the gain of self-confidence teachers report greater than 0? V=36, p=0.014

Conclusions

- Self-confidence
  - Scientist-teacher partnerships in elementary schools increase teacher self-confidence in science teaching when time and funding are limited.
  - Partnerships may have increased teacher confidence by providing practice designing and leading inquiry based science alongside a scientist.

- Partnership roles
  - Classroom teachers and UW partners co-taught science lessons.
  - However, co-teaching occurred to different degrees in different partnerships.
  - UW partners modeled inquiry-based science in the classroom.
  - Teachers provided classroom expertise.

References

Harkreader, G., Magier, C., & Varona, S. W. (2002). You Can’t Be a Teacher Without a Spaced Verbs of the Subject or Predicate. 4th Grade Mathematics Methods...? About the Classroom Teacher’s Problem-Solving Environment.

Acknowledgements

Many thanks to Devin Wilson, Pati Schaefer, the cohort of graduate students in the Fall 2013 Delta Internship Cohort for their support, advice and feedback. We are also grateful for the teachers and UW partners for their amazing commitment to teaching elementary school science.