

## Online Teacher Reflection as a Scaffold to Support Reform-Based Curriculum Implementation

Scott McDonald and Nancy Butler Songer  
The University of Michigan School of Education, 610 E. University 1228 SEB, Ann Arbor, MI 48109  
Tel: (734) 647-2077, Fax: (734) 763-1368  
Email: sbmcdon@umich.edu

**Abstract:** Teachers implementing technology-rich reform-based innovate curriculum are often the only teachers in their school or geographic region using a particular curriculum. This study examines the teacher-participants in the *Kids as Global Scientist: Weather* curriculum and how creating a web-based message board with a structured professional development focus may act as a community of support for these geographically separated teachers.

**Keywords:** reflection, computer-mediated communication, professional development, educational reform

### Introduction

This study was completed in the context of the One Sky, Many Voices (OSMV) (Songer, 1996; Lee) research and design group ([www.onesky.umich.edu](http://www.onesky.umich.edu)). OSMV designs and studies reform-based technology-rich weather curriculum for middle school students. As part of one such program, *Kids as Global Scientists* (KGS), students and teachers communicate with each other via a web-based message board. Over 200 teachers and 10,000 students participated in KGS, but most teachers are the only teachers in their building or perhaps their state participating in the program. Despite the fact that they implement the program simultaneously, one of the difficulties for teachers is that they do not have a local community of support to help them with the barriers they encounter. It was the intent of this research to be a first step in examining how the teacher message board could be used as a “just in time” professional development venue for the geographically separated teacher-participants of KGS. This study was designed to answer the question: What type of reflection-in-action do teachers do as part of an online community of practice? How does scaffolding this reflection through shared teacher-written vignettes and moderator prompting affect the type of reflection done by teachers?

### Theoretical Framework

Reflection is a term that has been used in many contexts and to describe a wide variety of activities. Reflection-in-action is a term defined by Schön (1983) to mean a vital type of reflection that occurs during a particular episode of a professional’s practice. This episode can be of very short duration to as long as many months (e.g. an architect designing and overseeing the building of a house), as long as the professional is engaged in on-going interactions with a project. Within this context a teacher implementing a reform-based curriculum over a period of eight weeks can be seen as a professional involved in an on-going project. The reflection on their practice they do during this project can then be considered reflection-in-action. This view is important as it characterizes the in-action thinking of teachers impacting not just the course and quality the implementation, but also the beliefs and attitudes behind their professional choices.

Even within this context, reflection is still a far-reaching concept and so there is a need to characterize different types of reflection. VanManen (1991) divides reflection into three categories: technical rationality, practical action, and critical reflection. Technical rationality is simply the description of an event (i.e. this is what I did). Practical action is a description of an event that includes the practitioner’s reasoning behind decisions made during the event (i.e. what I did and why). Critical reflection includes a consideration of larger moral or ethical issues that arose are part of the events (i.e. how the events were impacted by power relations within or outside the classroom). Previous studies have examined online teacher discourse and reflection (e.g. Harrington & Hathaway, 1994) and the literature about how cases or teacher stories can be used as a scaffold for reflection (e.g. Barnett & Tyson, 1999; Moje & Wade, 1997). However much of the available work is either exclusively face to face interaction, or has a face to face component with online discussion playing a supplemental or central role. This research agenda is concerned with how teacher vignettes or short cases can create a shared context that allows for in-

time reflective discussion between geographically distinct colleagues where no face to face interaction is possible. This study is a first attempt to characterize the reflective discourse occurring so that future interventions can be designed and refined to address emerging challenges.

## Data Collection and Analysis

In one run of the *Kids as Global Scientist: Weather* program ten teachers were selected from approximately 200 participants to be involved in the study. Five were teachers returning to KGS with at least one prior year of experience with the program. The other five teachers were first time participants in the KGS program, though they all had prior teaching experience. The intervention included the posting of teacher written vignettes to the teacher message board. The first set of these vignettes were used in previous years (Yorker, 1997) as part of a teacher email listserv. The second set of vignettes were written in conjunction with current teachers to represent issues raised during the first half of the program this year. Teachers participating in the study were given guidelines and asked to post responses to these vignettes on the teacher message board. Two groups of five teachers alternated weeks so that each week only half of the teachers were posting formal responses. Teachers were also encouraged to be regular participants in the message board outside of their formal responses to vignettes.

Data collected included pre and post interviews focusing on teachers' views of themselves as reflective teachers. In addition the interviews probed their feelings of local and distant support for professional development via the message board or other sources. The teachers were also asked to fill out a mid-point and post survey focusing on their attitudes and motivation regarding reflection on their practice, implementation of innovative curriculum, and professional development. In addition to these instruments, the teachers' postings to the message board were analyzed including messages that were either direct responses to or antecedents to the postings of teachers under study. Secondary sources of data included the journal of the moderator of the message board who recorded his thoughts about the reasoning behind his postings and prompts to the teachers.

These data were analyzed using a process described by Chi (1997) which allows for initial theory to inform coding categories, but also allows for coding to emerge from the data during analysis. This process allows for "qualitative data to be examined for impressions and trends, methods of coding are developed to capture those impressions, and the codings can then be analyzed quantitatively." (p. 276)

## Results

Preliminary results indicate teacher-generated vignettes support teachers' development reflection on the implementation of complicated technology-rich reform programs such as this one. Continued data analysis will clarify the role of vignettes as instruments of reflection and the degree to which certain kinds of reflection are generated and can be valuable as tools for improving practice.

## References

- Chi, M.T.H (1997). Quantifying qualitative analyses of verbal data: a practical guide. *The Journal of the Learning Sciences*, 6(3), 271-315.
- Barnett, C. S., & Tyson, P. A. (1999). Case Methods and Teacher Change: Shifting Authority to Build Autonomy. In M. S. Lundberg, B. B. Levin, & H. L. Harrington (Eds.), *Who Learns What from Cases and How?: The Research Base for Teaching and Learning with Cases* (pp. 53-69). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.
- Harrington, H., & Hathaway, R. S. (1994). Computer Conferencing, Critical Reflection, and Teacher Development. *Teaching and Teacher Education*, 10(5), 543-554.
- Lee, S. and Songer, N. B. (prepared for a submission to *The Journal of Learning Sciences*. Promoting Scientific Understanding Through Electronic Discourse.
- Moje, E. B., & Wade, S. E. (1997). What Case Discussions Reveal About Teacher Thinking. *Teaching and Teacher Education*, 13(7), 691-712.
- Schön, D. A. (1983). *The Reflective Practitioner*. United States: Basic Books.
- Songer, N. B. (1996). Exploring Learning Opportunities in Coordinated Network-Enhanced Classrooms: A case of kids as global scientists. *The Journal of the Learning Sciences*, 5(4), 297-327.
- Van Manen, M. (1991). *The act of teaching*. Albany, NY: SUNY Press.
- Yorker, C. (1997) *Creating Educational Reform: Learning to Teach the Kids as Global Scientist Curriculum*. Unpublished Dissertation Proposal, University of Colorado, Boulder.