

Moving beyond pedagogy: Developing elementary teachers' adaptive expertise in using the epistemic complexity of science

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Responding to the COVID-19 situation.

While our professional development (PD) sessions have always been structured flexibly around our overarching conceptual goals, which requires many small changes across sessions, there were two major adjustments that we made in response to the COVID-19 situation. The first is related to the professional development program and the second is on data collection processes.

Background

The participating teachers in our grant are drawn from rural areas in Iowa and Alabama. As part of our grant proposal we indicated that we would offer four different regional professional development sessions (3 in Iowa and 1 in Alabama, termed “clusters”), where grant personnel would travel to these areas and lead the professional development activities. Ten days of professional development were to be undertaken across each calendar year of working with the teachers. This involved 4 days in early summer, 2 days prior to school starting, and the equivalent of 4 days spread across the academic year. We had completed one full cycle of this professional development before the pandemic.

In our planning sessions - involving grant PIs, our two post-doctoral scholars, and the “cluster leaders” (teacher educators who work as regional education agency instructional coaches and independent consultants to support teachers through observation and reflective discussion of practice), we discussed how we might maintain the interactive nature of our PD sessions, we explored how to continue building the theoretical understandings we believe are important in framing adaptive pedagogy, and we wondered whether there might even be potential advantage of the use of technological tools we had not previously explored (without sitting on Zoom for many tedious hours).

This shifted the PD activities from four 4-day sessions into a single PD session that included all the participating teachers in Iowa and Alabama.

To achieve this, we did the following:

1. We implemented 4.5 days of PD to allow sufficient time for teachers (and for ourselves) adjust to the technological demands of virtual learning environments.
2. We broke the days into 3 major components. To support teachers' need for flexible scheduling, the first two components were synchronous and the third was available asynchronously or synchronously depending on individual preferences.
 - a. A theory discussion with one focal topic each day (i.e., Learning, Language, Argument and Dialogue) and conducted by university-based researchers was always the first session (75 mins/ day for 4 days)

- b. A discussion of the implementation of theory into practice conducted by cluster leaders and promising practicing teachers and focused on sharing and building pedagogical practices always followed (90 mins/ day for 4 days)
 - c. A selection of three “strands” (Language, Argument and Dialogue) from which teachers were asked to choose at least two to complete concluded each day (60 mins/day for 4 days)
3. During large group synchronous sessions, we regularly used breakout rooms to have small group discussions and sharing. This enabled interaction across clusters and across states, both within and across grade levels.
4. We also utilized the chat feature inside Zoom during large group synchronous sessions for promoting interactive discussion between participants when audio-video interactions were not feasible; this provided an ongoing conversation throughout each session.

We were pleased that teachers completed all sessions, with some asking for recordings of additional sessions that they were not enrolled in. Although we were initially concerned that teachers might be less willing to engage in this work given the practical challenges and uncertainties they faced in the spring of 2020, we were surprised to find that they were highly interested in discussions of theory- some teachers actually asked for these sessions to be extended- and excited to have supportive professional interactions with one another. Importantly, we believed that encouraging participating teachers to lead sessions helped engagement by all teachers and encouraged participants to take ownership of their learning as agentic professionals.

Second, the implementation of this type of professional development program shifted the ways in which we were able to collect qualitative data. As part of the grant proposal we indicated that we would conduct case studies with two different cohorts of teachers – a total of 30 teachers. We have collected a range of different data on these teachers. However, using the virtual PD workshop greatly increased the opportunity to collect individual teacher’s data related to their thinking on the various topics through online mechanisms. For example, we were able to include questions at the end of each session which were centered on asking them to provide reflective comments related to the topic. We asked each teacher to respond to vignettes related to the theoretical sessions as well as completion of reflections on the workshop itself.

The exciting outcome from a data perspective is that we are now able to generate a “long” qualitative file on each teacher, greatly increasing the amount of data on teacher thinking related to particular facets of the theoretical and practice concepts related to the project. We believe that while this will take time to analyze the quality and richness of the outcomes will greatly strengthen our ability to understand the shifts required in teachers to become more adaptive in moving to implement generative learning environments.

While holding the PD virtually required more planning in advance on our part, the challenge of designing these learning experiences that continued to move us toward the goals of the grant was highly generative in terms of the professional development program and data collection processes. Understanding and being adaptive to the changes was beneficial for us as a collective, and we think will show benefits to all participants – researchers, teacher educators, teachers and students across time.