Description of Learning Community Progress

1. Describe the process by which the members of your learning community work together.

In spite of the busy schedule of the teachers, we were able to meet four times as group (individual teachers also implement technologies in their own classrooms). Each of the meetings lasted about 1 hour to 2 hours. Mr. John Bell served as the coordinator for the meeting time and place. He sent out emails before each meeting to elicit possible meeting topics and coordinate schedule.

During these meetings, we tried out some technology enhanced science modules and shared different resources. The topics of the meetings were negotiated. I usually elicit initial topics and prepared some materials. Teachers discussed these ideas and provided topics that they wanted to work on for the meetings.

2. Briefly describe the learning community’s work, including the topics(s) addressed and/or activities implemented. Include products produced, if applicable.

We covered technology enhanced science instruction including the following topics:

- Analyzing sound waves by using Phet simulation, free software available from http://phet.colorado.edu/simulations/sims.php?sim=Sound. This simulation makes sound waves visible. Students can adjust the frequency, volume, and harmonic content and other variables. Students can also make connections to other Phet models on waves.
- Analyzing sound waves by using Raven Lite, free software available from http://www.birds.cornell.edu/brp/raven/RavenOverview.html. This software
allows students to record, save, and visualize sounds as spectrograms and waveforms. They can analyze various kinds of sounds including birdsong recognition, musical instruction. They review physics concepts of frequency, wavelength, amplitude, etc. The software can also be used to measure the speed of sound as a class demo.

- Poll response system. We purchased a set of clickers from http://www.turningtechnologies.com/. The poll response system helps teachers poll students’ responses on multiple forms of assessment items and present class results and statistics automatically. The participant teachers used it in chemistry and physics classes (e.g., AP exam prep).
- Online assessment systems such as Quizstar (http://quizstar.4teachers.org/), quia (http://www.quia.com/), and surveymonkey. These are online tools that teachers can use to create surveys and quizzes.

3. Explain how your work is impacting STEM teaching and learning.
Research on educational technology has shown that digital technology can facilitate students to learn complex science concepts. The fast development of modern technology also demands science teachers to be familiar with and use these technologies in science instruction so that our students are well prepared in the modern society. This project helps the participant teachers be familiar with the cutting edge technologies that they can employ in their science classrooms. As a community, we continue to discuss the opportunities and challenges in adopting technology-enhanced science modules in classrooms to help students learn complex science topics. The teachers have implemented the technologies in several classes, including having students work on computer simulations, using polling system, and develop online assessment items. Based on observations and teachers self reflection, students were engaged in these sessions.

4. What do you think is the most valuable aspect of participating in a STEM learning community?
Due to busy schedule and other responsibilities, in-service teachers need resource and support in implementing new technologies. A learning community provides such support from peers and college faculty. The participating teachers may help each other learn the technology; they may also inform each other about overlapping content areas where they may use similar technologies. For instance, the use of Phet simulations can be in physics, chemistry, and biology classes. Therefore, they may have similar experience to share with their colleagues. Another important factor about the technology learning community is that experienced teachers are not necessarily technology savvy. They may need help from novice teachers who are good at new technologies. In this way, they are creating an environment that is more collaborative.

5. Does your learning community plan to continue to work together?
Yes. We plan to keep looking into new technologies (e.g., mobile devices such as iphone and ipad) to help teach science. A continuation of the learning community is expected.