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6-14-2014

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Recommended Citation

Yin, Xinying and Spencer, Catherine, "Xinying Yin and Catherine Spencer FLC 2014" (2014). *Faculty Learning Communities*. 1.

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COLLABORATING THROUGH TEAM TEACHING (CTT) REPORT

Xinying Yin and Catherine Spencer

June 14, 2014

A. Brief description of team teaching that was done.

During Spring Quarter 2014, Dr. Catherine Spencer and Dr. Xinying Yin teach taught ESTM 628: Integrating mathematics and science in K-8 classrooms, with a focus on integrated STEM education.

B. Why/Purpose

Teaching need(s) addressed by team teaching

ESTM 628 is a course designed to help K-8 math and science teachers gain the knowledge and skills to teach integrated math and science with STEM perspectives. This course in Mathematics and Science Education requires the instructors to have expertise of the content, the philosophical underpinnings, and the pedagogical content knowledge of the STEM disciplines. In the team teaching, each of us contributed to the course not only our individual expertise in science and math teaching but also other different areas of expertise such as general pedagogy and research. While Dr. Yin did more background research in STEM education, Dr. Spencer brought to the course her excellent pedagogical skills to make the course more deliverable. Overall, our different experience and perspectives complement each other and made this interdisciplinary course possible.

C. Preparation

What preparation(s) did you have to make to do team teaching?

We met several times in Winter Quarter 2014 to discuss the planning of this course. We looked up extensive literature and gathered vast amount of resources from internet and conferences. During Spring 2014, each week we individually had preparation and then met every Monday morning for about 1.5 hours to reflect on previous classes and to plan new class session. We had a very good group of students who respected each others' input, challenges and critical questions so often we had to make decisions "on the fly" during the class sessions to rearrange "next" steps or to eliminate topics completely. The weekly planning meetings were critical in that we usually had to revisit topics that were still critical and introduce new experiences, as well. For class sessions, one of us went to PDC campus and the other at main campus co-teaching through tele-communication.

D. Administrative Issues

What administrative issue(s) did you have to address to make team teaching happen?

The grant allowed for both of us to work together in the winter quarter to prepare for the course. However, in terms of supporting Team Teaching, one of us "donated" the 4 hours of teaching time each week since the the 4 WTUs could only be earned by one of the instructors. If there were more students in the course (25 or 30 students instead of 7), it might have been a easy "fix" in that half of the students could have been assigned to one instructor and half to another.

E. Student Reactions/ Expectations

How did the students react to being team taught? Were their expectations different? Describe other student reactions or challenges encountered regarding students.

We started the quarter explaining the study to the students and telling them that both instructors were conscious that this would be a different experience for the students and at the end of the course we would ask them for their input.

The students had taken classes with each of the instructors previously and so there was a comfort level established before the class.

The class was small with three students meeting via teleconferencing at PDC and 4 meeting at the main campus in San Bernardino. The instructors decided that this was an opportunity to team teach with an additional twist so that both sets of students would feel as involved as possible. The students were not expecting that, but informal comments throughout the quarter encouraged the instructors to continue with one of us in both classrooms, though we alternated halfway through the quarter.

At the end of the quarter, we surveyed students about their opinions regarding the team-teaming. They all commented that with two instructors present in both locations, their participation and engagement in the class content was significantly improved. Their learning has been benefited from the different perspectives, ways of delivery and feedback from the two instructors. I would like to cite some students' comments on our collaboration: "...Our class questions were always responded by one or the other and at times each of the professors proposed responses. Long distance learning is always difficult but you two made it a great experience. Together you two definitely complemented each other." "I think the biggest benefit was the model of how collaboration can be successful. Seeing both professors bounce ideas back and forth was a thing of beauty. I don't know if it was done on purpose but it model teamwork perfectly." "A problem that I thought was going to arise, but never did was differing views that ended up in an argument rather than a discussion. A lot of the time team members don't understand that a comment is not a negative critic. Seeing both instructors in action proved you can have more than one driver and still get to your destination."

F. Teaching

What impact did this have on your teaching?

Through the collaboration, we really learned a lot from each other and from the collaboration process itself. The conversation during the collaborative reflecting and planning sessions helped us generate numerous new ideas and deepened our understanding about integrated STEM education. We do feel that such collaboration prepared us to individually teach this course in the future; and without such collaboration, we could not have developed the understandings and skills to teach a sufficient integrated STEM education course.

Dr. Yin, as a junior faculty member, has learned from Dr. Spencer not only her expertise in mathematics teaching and perspectives for integrated STEM education, but more importantly her knowledge about students, local context and pedagogical skills in college classroom. Dr. Spencer, a fulltime lecturer, learned so much about science education. Dr. Yin brought in quite a few published research articles to be used during class. Not only did the articles support student growth but also Dr. Spencer's!

G. Evaluation

What did you do to evaluate the effect of team teaching on student learning? your and your partner's teaching skills? How did this affect student grading, SOTE's?

For student learning, we did pre and post surveys to assess (the changes in) students' understandings about the practice and the nature of STEM disciplines as well as teaching integrated STEM curriculum. For our teaching skills, we audio recorded all the planning and reflecting meetings as well as the class meetings. In our meetings, we constantly reflected on how our understandings about STEM education were developing and how to improve the course in the future. We also kept personal reflective journals and email exchanges. Following this course, we plan to take a deep look at the audio recordings and the reflective journals to have a better understanding about how our teaching skills for this course have developed.

We do not feel the team teaching affected student grading. Because Dr. Yin was the instructor of record, she graded all the assignments first and then Dr. Spencer looked them over. If concerns arose, we would discuss and come to agreement.

H. Other additional comments, future plans on team teaching.

We really enjoyed the collaborative team teaching. We felt that this newly conceptualized course could not be done without such collaboration. In the future, we would conduct deep analysis on the class activities, students' assignments and our collaborative processes. From such analysis, we will be able to see better how to improve this course in the future.

We plan on applying for a similar grant next academic year to help us focus more on the team teaching dynamics. The curriculum ended up being substantially different from the previous year so that ended up being our main focus during our weekly meetings. It was critical to us that the students get the best course that two instructors could deliver. It is our expectation that after one more experience with both of us teaching the course, each of us will feel confident in both content and pedagogy to teach the same high quality course independently.