Faculty Learning Community
Project Proposal Form

Name: **Miriam E. Santana Valadez**
Course(s): **Integrated Algebra & Foundations of Algebra**
Project Name: **Clickers in the deaf and hard of hearing math classroom**
Date: **Spring 2009**

Identifying the problem:

1. What is the problem you have identified?
   - How do I know if the students understood my explanations?
   - How could I engage students and improve student participation and communication?

2. What is your goal or ideal outcome?

   I believe that the use of technology in the classroom facilitates Teaching and learning. One of these new technologies is clickers. With clickers, students have an input device that lets them express their views in complete anonymity, and the cumulative view of the class appears on a public screen.

   I believe that by using clickers in my classroom I will be able to improve participation, communication, and I will be able to engage students during my lectures.

3. Who are your target students?
   My target students are deaf and hard of hearing students taking Integrated Algebra and Foundations of Algebra at the National Technical Institute for the Deaf (NTID).

4. What is your hypothesis or proposed solution?

   I believe that by using clickers in my classroom I will improve communication with my students and I will give equal opportunities of participation to all.

5. How will you assess your project?
   Five sets of data will be collected. Three qualitative and two quantitative.

   Quantitative
   - Survey at the end of each course

Identify project resources:

1. Resources –People/ Faculty/Student Advisors
    - Katie McDonald and Hope Williams will help me introduce the use of clickers in my classes.

2. Resources – Conferences
    - **The 29th International Lilly Conference on College Teaching**
      "Evidence-Based Learning and Teaching"
      Miami University
      Oxford, Ohio
      November 19-22, 2009

3. Resources – Readings

    Bibliography

    - Cline, K.S. "Classroom Voting in Mathematics" *Mathematics Teacher* Vol 100, No 2 September 2006.
    - Guthrie, R.W. and Carlin, A. "Waking the Dead: Using Interactive Technology to Engage Passive Listeners in the Classroom," *Proceedings of the Tenth Americas Conference on Information Systems*, New Your, August 2004.
    - Johnson C., "Clickers in Your Classroom" *Wakonse-Arizona E-Newsletter*, Vol.3, No 1, 2004.
    - Lowery, R.C. "Clickers in the Classroom: A Comparison of Interactive Student-Response Keypad Systems" 5 April 2006 (Website)
    - Martyn, M. *Educause Quarterly*, Number 2, 2007.
    - Stinson, M., Liu Y., Saur, R., & Long,G. (1996). Deaf college students' perceptions of communication in mainstream classes. *Journal of Deaf Studies and Deaf Education, 1*, 40-51.

Action plan/Timeline:

1. Collect and analyze data
    End of Winter and Spring Quarters 2009

RESULTS

Data Collection

- 51 students from NTID interviewed
- 6 groups of students
- 3 groups during Winter Quarter
  - 2 Foundations of Algebra class
  - 1 Integrated Algebra class
- 3 Groups during Spring Quarter
  - 2 Integrated Algebra class
  - 1 Foundations of Algebra class

Results from the Survey

1. 0% of the students Strongly Disagree, 2% Disagree, 22 % Neutral 53 % Agree, a 24% Strongly Agree and 0% said is Not Applicable that they feel more likely to participate and share answers to the instructors' questions using clickers
2. 0% of the students Strongly Disagree, 6% Disagree, 18 % Neutral, 45 % Agree, a 29% Strongly Agree and 2% says is Not Applicable that they feel more comfortable participating in class when we use clickers because the answers are anonymous
3. 0% of the students Strongly Disagree, 8% Disagree, 14 % Neutral, 53 % Agree, a 25% Strongly Agree and 0% says is Not Applicable that feel clickers help to improve communication with the instructor in the classroom.
4. 0% of the students Strongly Disagree, 6% Disagree, 18% Neutral, 49 % Agree, a 25% Strongly Agree and 2% says is Not Applicable that by using clickers they were more likely to ask for clarification from the instructor or another classmates when they didn't understand something.
5. 0% of the students Strongly Disagree, 4% Disagree, 27 % Neutral, 47 % Agree, a 22% Strongly Agree and 0% says is Not Applicable that feel more motivated in learning when they use clickers
6. 0% of the students Strongly Disagree, 4% Disagree, 22 % Neutral, 53 % Agree, a 20% Strongly Agree and 2% says is Not Applicable that using clickers help them to verify their understanding of the class.
7. 0% of the students Strongly Disagree, 2% Disagree, 24 % Neutral, 49 % Agree, a 22% Strongly Agree and 4% says is Not Applicable that the instructor shifted the explanations based on students responses to the clicker question.
8. 0% of the students Strongly Disagree, 2% Disagree, 22 % Neutral, 49 % Agree, a 27% Strongly Agree and 0% says is Not Applicable that by using clickers they were more likely to study questions they did not do well on

Reflection on your project:

1. What were your successes?
    - Students started clicking…
    - Immediately the interaction with my students began.
    - Students got engaged; they felt comfortable participating in a safe environment.
    - Quick way for students to validate their own learning, and to identify areas of improvement.
    - Quick way for me to evaluate students understanding, allowing me to make instructional decisions.
    - Engagement, participation and improvement of communication were facilitated with the use of clickers.

2. What obstacles did you face?
   I faced three challenges
    - To learn how to use clickers and to bring the technology into the classroom
    - To obtain clickers for all my students
    - To develop a portfolio of activities that requires clickers for two of my courses.

3. Any surprises ?
    - I find out that asking the right questions was as important as the use of the technology.
    - I realized that after identifying misconceptions with the clickers, providing frequent feedback was important.

4. What would you do differently next time?
    - Next time I will research not only about the new technologies but also about good teaching practices connected with the use of these technologies.
    - The use of new technologies in the classroom is important. Equal in importance is the use of adequate teaching techniques associated and connected with these new technologies.
    - Technology is not enough, a good pedagogy connected with the technology is necessary to succeed in teaching and learning.

5. What opportunities exist for future work in this area?
   Other applications that I would like to explore
   - Graded Activities
   - Attendance/Participation credit
   - Low-stakes quizzing
   - Often for bonus credit
   - Peer Instruction
   - Practice Activities
   - Review for high stakes exams