Dee Family Technology Awards
Proposal for Funding
Due April 1, 2006

Project Title: **Increasing Students' Class Participation through Interactive Technology or "Clickers"**

Project Director: **Marjukka Ollilainen, Associate Professor**

Department(s): **Sociology & Anthropology**

College(s): **College of Social and Behavioral Sciences**

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Other Members of the Project Team:

Instructions:

Please complete each section in the space provided. The justification section should not exceed two single-spaced typed pages.
You are required to obtain the signature of an ARCC representative for your college, indicating that she/he is familiar with the proposal, and can speak to it during funding deliberations.
Your department chair's signature is also required, indicating that she/he supports the proposal, and that the proposal is in keeping with departmental goals related to information technology and its applications to the academic mission of the institution. Your Chair's signature also indicates her/his commitment to help support the project financially if so indicated on the budget page.
The form below must be emailed (without signatures and in PDF format) and a hardcopy mailed to the ARCC chair, David Ferro, dferro@weber.edu and MC 2401 by April 1, 2006.

ARCC Representative:
I have read the proposal and discussed it with the Project Director.

ARCC Representative

Comments:

Department Chair:
The Department has reviewed this project within the context of overall information technology planning within the Department. If the budget page indicates financial support from the Department, I agree to commit those funds to this project.

Department Chair

Comments:

College Dean:
I have reviewed this project. If the budget page indicates financial support from the College, I agree to commit those funds to this project.

College Dean

Comments:

Justification

Your proposed project should be described as clearly and succinctly as possible in the spaces provided below. Be sure to review the "Criteria for Funding" document. *The entire justification section should not exceed two single-spaced pages.*

Abstract (project summary):

I am applying for the Dee Family Technology grant to buy an interactive classroom response system (CRS) to encourage active learning, increase student participation, and help improve teaching of large "Introduction to Sociology" courses (see Appendix A for information on the technology). I am requesting funding for a response system package that includes instructor hardware and software and hand-held response units or "clickers" for students. In order to provide a unit for all students in a large lecture course, I am requesting funding for 75 units. With the use of clickers as part of my introductory sociology course, my goal is to assess students' grasp of the course material on the spot and to keep them engaged throughout the class by participating discretely and without fear of speaking up. Because the use of interactive technologies is a rather new development in university instruction, I also have a scholarly interest in how they influence student learning. I believe that clickers would be especially useful in social sciences courses and propose that this project serve as a pilot study for their use in the college and, potentially, the university.

Objectives and goals of this project:

This project has both short term and long term goals. My primary short term goal is to make Introduction to Sociology (Soc 1010) more interactive and to enhance students' ability to share their views about the topics I cover in class (and also see how others think). As a general education course, the sociology introductory course serves a wide audience of students on Weber State campus and thus attracts a diversity of voices and experiences. I have found class discussions the best way to help students understand the class material, but have noticed that while some students are vocal in the classroom, others prefer not to talk in a large class. I hope that an anonymous response from each student using a clicker will empower even the shy students to respond, share their ideas, and get immediate feedback on how well they understand the concepts and theories discussed in class.

After I have learned effective use of the response system, my long term goal is to share my experiences with my department colleagues who also will have a chance to use the clickers in their Sociology and Anthropology courses. In case there is broader interest in the interactive class technology in my college, I will be glad to discuss my experience with others on campus. My other long term goal is to develop a study to evaluate the effectiveness of this technology especially in teaching sociological concepts and ideas. I plan to assess the benefits of the CRS technology for especially social science students and to study and publish my findings in a sociology teaching journal.

Identify specific courses and/or programs that will directly benefit from this project:

(You may also want to describe how specific courses may be enhanced by this project.)

As I plan to use the interactive classroom response technology in my Sociology 1010:

Introduction to Sociology general education courses, my goal is to encourage active learning and to keep students engaged in the discussion even in a large class. If responding to the professor's questions in class is comfortable and easy, it is likely that students will become more engaged with the material and have more fun in class. They will also get improved instruction as I will be able to respond to any problems immediately while lecturing. In time, I plan to also build the technology into students' group work and use it to administer prognostic quizzes in class on what gaps may exist in students' understanding.

My colleagues' courses will eventually benefit from the technology, as they will also be able to use it. Most response systems in the market today allow for their transfer from one classroom to another. While this technology can be useful in small classes, I hope to especially target the large classes that in our department vary from 60-80 students and where students may easily feel like a number, despite my continuing efforts to involve everyone.

If applicable, describe how this project will help to increase faculty productivity or enhance competency in some area of information technology.

Interactive student response technologies are used widely on college campuses today and research on their effectiveness is beginning to appear in scholarly publications (for a comprehensive assessment of the technology, see information links in Appendix A).

As a university, Weber State prides itself on its close student-professor interaction. Therefore, I believe that clickers could be one important strategy to further encourage close interaction and help students gain ownership of their classroom experience. Furthermore, a competent and context-specific use of interactive classroom response technologies may well become a future requirement for face-to-face instruction in higher education.

Describe how the success of this project will be evaluated.

(If reports or publications are anticipated from this project, please indicate such.)
The best way to evaluate the success of this project is to assess how students benefit from this technology. I plan to evaluate their experience with clickers at the end of the Fall 2006 semester through a separate survey administered with course evaluations. I also plan to research the use of clickers in discussions of more sensitive materials (e.g., racial-ethnic relations, affirmative action, sexuality, etc.) and how their use may assist in providing a more inclusive atmosphere. This is a particular question I am interested in researching and writing my findings into a scholarly publication for a sociology teaching journal.

Timeline: (If funded, when will this project be implemented?)
Fall 2006 – I plan to first use the clickers periodically as an interactive tool in my two sections of Soc 1010 order for me (and the students) to become comfortable with their use.
Spring 2007 – After students' evaluation of clickers and having learned their appropriate use for teaching sociological material, I plan to build the technology into the course syllabus where it will be an integral part of lectures and assessment. If clickers are beneficial for students, they will become a part of the course.

Budget

Note: Please be as specific as possible regarding requested hardware, software, or other resources. If funds are being committed from other resources, please so indicate.

Source	Total
Dee Family Technology Award request	$4,500
College of Social and Behavioral Sciences	$400
Dept of Sociology & Anthropology	$100
Total	$5,000

Explanation of budget

As the popularity of interactive classroom technologies has increased, a number of companies have emerged to provide the hardware and software technologies. Price estimates for various interactive packages range from $2,300 to 8,000 (see Appendix B), depending on the vendor and technology used – infrared (IR) or radio frequency (RF). I have obtained quotes from a variety of vendors for an appropriate system for my (and my colleagues') classes, which would include a portable hardware/software package and 75 student clickers. My total budget estimate for an appropriate package is $5,000 ($4,500 requested from Dee Family Technology Awards, $500 matching contribution from my College and Department). As far as technology is concerned, for as many as 75 students, the most appropriate technology would be radio frequency, but since the response system would be used in only one classroom at a time also an infrared beam would work (although some vendors say IR is not as effective and RF with more than 60 students). I trust that a budget of $5,000 will be sufficient to purchase an appropriate and effective technology for the purpose of social science classes.

Because these systems vary somewhat in their technology and specific features, I do not, at this time, prefer any particular interactive system or a brand. However, if this instructional technology is going to be adopted more widely on campus, I will continue interactions with Gail Niklason and the IT Division (who also plan to seek ARCC funds for piloting a classroom response system) to coordinate our technology choices and provide compatible systems on campus.

Please see Appendix B for detailed information about each system I have researched, including a price estimate.

Source: Vanderbilt University, Center for Teaching, retrieved 3/27/2006.

http://www.vanderbilt.edu/cft/resources/teaching_resources/technology/crs.htm

What Is a CRS?

A classroom response system (sometimes called a "personal response system" or "audience response system") is a set of hardware and software that facilitates teaching activities such as the following. A teacher poses a multiple-choice question to his or her students via an overhead or computer projector, perhaps using PowerPoint to do so.

Each student submits his or her answer to the question using a handheld transmitter (often called a “clicker”) that beams an infrared or radio frequency signal to a receiver attached to the teachers computer.

Software on the teachers computer collects the students answers and produces a histogram showing how many students chose each of the answer choices.

Teaching with a CRS

Activities

Teaching with a CRS can take a number of directions. Teachers will want to match activities to course content, time constraints, learning objectives, and their own teaching styles. Some possibilities for CRS activities include the following.

Ask the Audience: Often described as the "Who Wants to Be a Millionaire" Lifeline activity, the most basic CRS activity allows the instructor to pose a multiple-choice question and display the results in real-time. Questions can be intermixed with lecture content to allow instructors to gauge student understanding and adjust lectures accordingly.

Peer Instruction: The teacher poses a question to his or her students. The students ponder the question silently and transmit their individual answers using the clickers. The teacher checks the histogram of student responses. If significant numbers of students choose the wrong answer, the teacher instructs the students to discuss the question with their neighbor. After a few minutes of discussion, the students submit their answers again. This technique often (but not always!) results in more students choosing the correct answer as a result of the peer instruction phase of the activity.

Attendance and Quizzes: If transmitters are assigned to students for the duration of the course, then a CRS can be used to take attendance or to give for-credit multiple-choice and true-false quizzes and tests.

Interactive Demonstrations: In science classes, students can be asked to predict the outcome of an experiment prior to being shown the experiment. This gives the teacher a sense of the students' preconceptions and increases the surprise value of the experiment when students see just how many of their classmates expected different outcomes.

Why Use a CRS? (App. A page 2)

A teacher can use a CRS to...

...Maintain students attention during a lecture. Studies show that most peoples attention lapses after 10 to 18 minutes of passive listening. Inserting a few CRS-facilitated activities every so often during a lecture can help maintain students attention.

...Promote active student engagement during a lecture. Posing well-chosen questions to students during lecture and expecting answers from each student can cause students to reflect on and assimilate course content during class.

...Promote discussion and collaboration among students during class with group exercises that require students to discuss and come to a consensus.

...**Encourage participation from each and every student in a class**. Asking a question verbally and calling on the first student to raise his or her hand results in one student participating. A CRS-facilitated activity can involve not one, but all of the students in the class.

...Create a safe space for shy and unsure students to participate in class. A CRS gives students a chance to respond to a teachers question silently and privately, enabling student who might not typically speak up in class to express their thoughts and opinions. A CRS also enables students to respond anonymously to sensitive ethical, legal, and moral questions.

...Check for student understanding during class. By asking CRS-facilitated questions, teachers can determine if students understand important points or distinctions raised in class. They need not wait until homework is turned in or exams are completed to do so. Instead they can receive feedback on a lecture during that same lecture.

...Teach in a way that adapts to the immediate learning needs of his or her students. If a histogram of student answers shows that a significant number of students chose wrong answers to a question, then the teacher can revisit or clarify the points he or she just made in class. If a histogram shows that most students chose the correct answers to a question, then the teacher can move on to another topic.

...Take attendance and to rapidly grade in class quizzes, provided that each transmitter is assigned to a unique student over the length of a course. Note that different CRS systems provide different levels of support for anonymous and non-anonymous usage.

...Add a little drama to class. There is often a sense of expectation as wait for the histogram to appear showing how their classmates answered a given question.

For more detailed information and comparison of the different technologies and brands of clickers, see for example a report prepared by University of Missouri.

http://etatmo.missouri.edu/toolbox/doconline/StudentResponseSystems.pdf

Appendix B

Pricing estimates for selected clicker systems and technologies, listed from the least to the most expensive. The quotes reflect this project's need for a system and 75 student units.

H-ITT http://www.h-itt.com/

Based on the company web site, the "Hyperinteractive Teaching Technology"(infrared) package would entail 2 "base units" (1 for 50 students, $200/ea), 75 transmitters ($25/ea), 1 USB cable ($5), 1 AC adaptor ($15) **$2,295.00**

GTCO CalComp http://www.GTCOCalComp.com

The "Interwrite.PRS™" system, with either IR or RF technology. The IR system is currently used at Utah State University (who has ordered 850 clickers).

PRS IR – primary and secondary receivers, software, and 75 IR clickers **$3,106.00**

PRS RF – receiver, software, cables and 75 RF clickers **$4,432.95**

Turning Point Technologies http://www.turningpointtechnologies.com

This system is currently tested on campus by Clayton Oyler in Academic Support Services & Programs. It is a system that uses PowerPoint as software. Based on a price quote obtained by Mr. Oyler, a package including perpetual licensing for 75 students, RF receiver, 75 clickers and two carrying cases (but not including S&H): **$4,799.00**

Renaissance Learning, Inc. http://www.renlearn.com

Renaissance Classroom Response System package (incl. software, school-site license, test generator, gradebook and 24 student units)

+ 51 additional student units

+ shipping and handling **$5,572.59**

einstruction http://www.einstruction.com

This system is used in Microbiology on WSU campus (I believe they use the IR technology), but entails students buying their own clicker and downloading software onto it each semester. According to an einstruction sales representative, for 75 students, I would need clickers that use radio frequency. A software package with 32 student "pads" costs $3850 + additional 43 student pads ($100/ea) **$8,150.00**