Tracking Student Participation in Large Classes

Project Proposal

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Overview: The Application

1)

The application is intended to provide an easy, efficient manner in which to track the participation and discussion contribution of the students in classes of 50 or more students. The application will allow the quality of the contribution to be graded as well, whether that contribution was made in class or through a web-based medium, such as a newsgroup.

2)

On the market is currently one exiting similar application, provided by eInstruction®. eInstruction's application requires each student to purchase a remote control and register that remote control online. These remote controls emit radio frequencies that are picked up by a central receiving unit, which the instructor is required to purchase. With these remote controls, students are able to submit alphanumeric (0-9 with decimals, A-J) responses to questions posed by the instructor. The software provided by eInstruction allows the instructor to track the overall accuracy of student responses and view poll results via graphs. In addition, each session that utilizes this system must begin with a period of time in which students are required to use their remote controls to hail the receiver and assure their inclusion in the session; students wishing to join the session once this step is over are blocked.

The largest drawback to eInstruction's application is that much of the process lies in the hands of students, forcing the instructor to give step-by-step instructions to students. This slows down the entire process of polling a class. Further, since this application limits students to alphanumeric responses, posing essay-type questions to the class is unfeasible for an instructor hoping to use this system: receiving such a response through eInstruction's remote controls is impossible, and there is no way to grade the quality of the response sent through the remote controls (beyond indicating 'true' or 'false').

Besides the application provided by eInstruction, other methods of tracking participation involve inefficient database models that use arrays or spreadsheets which must be filled in by the instructor. These spreadsheets are heavily time-consuming and difficult to manage. Inputting data must also be done manually, which is why many instructors still use paper models as opposed to digital models.

3)

Tentatively, this participation tracking system will work by utilizing many handheld transmitters and a single receiver. Each student (either through purchasing their own, or borrowing from a class set) will be given one transmitter. This transmitter will have a single button, to signify when the student has volunteered something in class. The student can press their button either during or after volunteering. When a student has pressed this button, a name and picture will pop up on the instructor's screen, along with an input box for a number. Each transmitting box will have its own unique id number, and be assigned to a student for the duration of the semester.

The instructor will then use the numerical scale to enter a quality rating, ranging

from zero to some preset maximum value. Negative numbers may be allowed to discourage false button presses. These name/face combinations can queue up on the instructor's screen, first volunteer on top, and moving downwards. This way, a instructor is not necesarilly glued to their computer, but can return periodically to enter their ratings. When a submission has been rated, it will disappear from the queue screen.

All these volunteer ratings will be stored into a database. This database can return both personal information and group information, such as maximum, minimum, mean, and mode. Using all this information, at the end of a semester, the instructor can then assign participation grades. The initial entry of names and pictures into the database will be handled either manually by the instructor, by scanning an email in-box and having students submit them, or by scanning through class accounts.

The most difficult aspect of implementing the interface is the establishment of an efficient yet humane method of student identification. To this end, there are two basic situations that will be addressed: The first situation involves a class set of student-used devices, and the second involves each student purchasing his or her own such device. In the first situation, it will become necessary for the instructor to subscribe to assigned seating for the students. The instructor will adhere a single device to each seat and will record which student is to use which device via the application's software. In the second situation, each student will be required to identify and register the serial number of his or her device. The nature of this device is described in the following paragraphs.

Software for the application will reside on a desktop personal computer running the Microsoft Windows XP operating system. The data, comprised mostly of students' names, identification numbers, and contribution grades, will be kept in a database. This database will be stored in a text file, with delimiters to separate between data; this allows the data to be imported into spreadsheet applications like Microsoft Excel, and therefore allows wide-spread, existing tools to be used for analyzing data.

4)

Our application provides five key services not entirely provided by other applications: students are allowed to give essay-type responses; student responses can be graded on quality; the centralized application input process involves only the instructor; the input process is simple and may be completed numerous times during a given class discussion; instructors are given the freedom to choose whether a student's response is worthy of grade points, regardless of when that student enters the classroom.

Appeal

5)

Traditionally, instructors have not tracked student participation on a computer. Often, instructors just place tally marks next to students' names on a prepared hardcopy list of names. Instructors who do use computers have most commonly used spreadsheets that emulate the analog process of keeping tally marks. However, these processing have generally been limited to smaller classes , with maximum sizes at approximately 30 students. Instructors with large classes of 50 to 200+ students generally do not track participation because the traditional processes do not scale efficiently.

Our application specifically targets those instructors with large classes of 50 to 200+ students in which discussion between the instructor and the students is possible. This is a relatively new population within the target sphere of such applications.

Users

6)

The target users are instructors, such as teachers, professors, teaching assistants, and lecturers, who are communicating with classes of 50 students or more, or who teach many classes, and wish to track the quantity and quality of discussion contributions of students.

Demographics: age 25-60; employed at a high school (mostly female) or college (mostly male).

Persona:

James Rodriguez has PhD in Public Health and teaches at San Jose State University. He teaches classes on pollution, the effects of industry on human health, and health economics. He wishes he could get more feedback from his students, but does not know how to reward those students who have the courage to respond to his questions in his eighty-student classes. At the age of 35, he has a wife named Betsy and two children — Juanita, age 10, and Enrique, age 13. James has two computers at home, Sputnik and Hal. He has a cellular phone with a Shaft ring tone; his wife also has a cellular phone.

Test Subjects

7)

Unconfirmed:

Test Subject #1
Age: approx 35
Gender: male
Occupation: professor
Number of Classes with 20-30 students: 3
Number of Classes with 30-50 students: 1
Number of Classes with 50-100 students: 0
Number of Classes with 100-200 students: 1
Number of Classes with 200-400 students: 0

Test Subject #2
Age: approx 50
Gender: male
Occupation: assistant professor
Number of Classes with 20-30 students: 0
Number of Classes with 30-50 students: 0
Number of Classes with 50-100 students: 0
Number of Classes with 100-200 students: 1
Number of Classes with 200-400 students: 0

Test Subject #3
Age: approx 50
Gender: male
Occupation: professor
Number of Classes with 20-30 students: 2
Number of Classes with 30-50 students: 0
Number of Classes with 50-100 students: 0
Number of Classes with 100-200 students: 1
Number of Classes with 200-400 students: 0

Test Subject #4
Age: approx 45
Gender: male
Occupation: professor
Number of Classes with 20-30 students: 0
Number of Classes with 30-50 students: 0
Number of Classes with 50-100 students: 0
Number of Classes with 100-200 students: 0
Number of Classes with 200-400 students: 2