

Course Evaluations Online: Putting a Structure into Place

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ABSTRACT

For a variety of reasons, universities are seeking ways to put course evaluations online. We describe a pilot program implemented in the College for Computer Sciences, Mathematics and Physical Sciences at the University of Maryland. We will describe the process that began with a committee articulating needs, tailoring the use of WebCT as the overall environment, creating specialized tools for supporting students and faculty, and downloading the data for statistical processing. The paper discusses the issues the project faced, the resolutions to these issues, and new challenges facing this program.

Categories and Subject Descriptors

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1. INTRODUCTION

The University of Maryland created for one of its Colleges the ability to convert course evaluations from scan sheets to a Web-based questionnaire. Pilots were conducted during Summer and Fall terms 2003, with increasing the number of courses and students completing the evaluations. The Dean mandated that this method be used for all courses in the Spring 2004 semester. The paper describes some background in the course evaluation process at Maryland, the structure of the project, administrative and technical adaptations, lessons learned in the process, as well as the future projections for the project.

2. HISTORY

2.1 Evaluation Process at the University of Maryland

The course evaluation process at the University of Maryland is a highly decentralized activity. Historically, individual colleges – and in some cases, individual departments – have gone their own way with respect to questions asked, implementation methods and

data summaries. Until recently, almost all evaluations have been conducted in the classroom using paper-based forms. Even today, some smaller academic programs use a questionnaire whose results are transcribed by hand; others use optically scanned sheets. A few colleges have developed their own college-centric custom scan sheets. Many of these groups have used the Statistics Laboratory in the Office of Information Technology (OIT) to develop custom data processing and reporting programs written in the SAS statistical language.

The College of Computer, Math and Physical Sciences (CMPS) was the first such group to work with the Statistics Lab to develop a questionnaire and a series of reports to be used throughout the college. However, each individual department worked with the Statistics Lab to tailor the reports to their specific needs.

In 1999, the Physics Department began a pilot project to investigate the feasibility of web-based evaluation forms. For this pilot, the scan form was mimicked with a Web interface to a Coldfusion database. Initially, only a few courses were evaluated online, and their data were merged with the rest of the traditional scanned evaluations. Within a year, all Physics evaluations – totaling over 3000 students – were online.

The success in the Physics Department not only saved paper and scanning costs, but it also eliminated sources of potential error (e.g., damaged or misplaced scan sheets). This also reduced the amount of time required to produce the final reports.

Following this successful pilot, other departments within the College expressed interest in using on-line evaluations. Unfortunately, the original pilot implementation had been tailored to the special requirements of Physics; a larger scale deployment would have required extensive custom programming and management for each additional group. We quickly need to find a solution that could be more easily scaled, not only to the College but also a potential as a campus-wide solution. After reviewing a variety of approaches at other institutions, we concluded that our existing WebCT course management environment could be extended to meet our needs. WebCT is centrally supported at the University by a professional staff of five. The survey tool in WebCT offered an electronic confidential means to collect evaluation data from students on their courses which could be transferred to the Statistics Lab for processing.

2.2 Initial Planning for WebCT as Course Evaluation Environment

A committee was formed with representatives from the Dean's office in CMPS, departments within the College, and OIT. These initial meetings were used to present the WebCT environment and to discuss the specific evaluation needs for the College. Some of the specialized needs of the College were the ability to tailor and

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send introduction emails (one per student) as well as reminder emails (to students who had not completed specific evaluations) where the frequency of reminders can be controlled by each department in the College. Departments wanted a mechanism when if a faculty member chose to give extra-credit, then a list of students who had completed the evaluation would be available to the faculty at the end of the evaluation period.

OIT needed an administrative structure that not only would meet the needs of CMPS, but also could be scaled to the entire campus (should that be required). Departments were a natural organizational structure; WebCT “course” spaces were created for each department in CMPS. A college would be more complex to manage as the granular unit. Departments on the campus often have the same evaluation for the entire faculty in a department. One WebCT “course” is created per department (hereafter, evaluation space) and one “survey” (a tool available in WebCT) is created for each University course.

A representative and a backup person were selected from each department to serve as the liaisons in the process. Tools were created by OIT staff to support the department representatives in their communication with students, as well as to provide a method for department representatives (DR) to do very basic troubleshooting for students. OIT created a student response tool on the request of DR to enable them to receive student response rates upon request for each evaluation and the overall rate for the department. DRs were trained by the OIT project manager in both the tools to support email and response rates, and a rudimentary knowledge of the WebCT survey tool.

3. BEHIND THE SCENES: TECHNOLOGY STRUCTURE

3.1 Creation & Access Control for Surveys:

One template for each evaluation space was created for instructor evaluations and another for TA evaluations. Access controls were set so control students’ access to only the surveys for the course(s) they are enrolled for that semester. A standard naming convention was established for the surveys in order to facilitate setting access criteria. These department-wide evaluation spaces were separate from actual course spaces, which may or may not exist already in WebCT.

Surveys were created from the appropriate template and named according to the course number and section number. For example, the survey for an instructor for Physics 101 section 0102 was created from the instructor evaluation template and named using the following convention:

PHYS 101-0102 Course Evaluation (Instructor)

When students are loaded (see below for detail on this process), one of the data items (a list) loaded into each student record in the evaluation space is ‘Full Course’. This indicates both the university course number and section of the course(s) in which the student is enrolled in that department. Access to each survey is granted based on the criteria. An example of the convention for a student in Physics 101 section 0102 is:

‘Full Course’ contains *PHYS1010201*

In addition to the release criteria above, dates are set for the release of the survey, ending the last day of courses.

WebCT allows for icons on the homepage to be linked directly to surveys. These icons shared the same release criteria and dates for as the evaluations described above.

3.2 Loading Students

At the University of Maryland, students can be loaded into the WebCT system and their WebCT courses using the Campus Directory (LDAP). This is done regularly for courses using WebCT on campus. In the instance of the course evaluation surveys, all students with a course in the department were loaded into the department evaluation space. Students were identified to be loaded into an evaluation space if they were registered in one or more courses in that department. When students were loaded into the evaluation space, a comma-delimited list was added to their record in the space for each course they were registered. A student in both Physics 161 section 0101 and Physics 171 section 0201 would have an entry under ‘Full Course’:

PHYS1610101,PHYS1710201

3.3 E-Mail Reminders

A Web site was created for the department representatives. Campus Directory authentication is required to access this page. Once authenticated against the Campus Directory, usernames were matched against access listings in order to provide the appropriate options/control for each representative.

From this site, department representatives are able to send introduction or reminder messages:

An “Introduction message” is sent to all students in the representative’s department; this message also is sent on submission of the web page form.

“Reminder messages” are placed into a queue with information regarding the beginning and ending dates, as well as frequency set by the department representatives. Reminder messages are processed once a day (in the morning). Any messages, for which the criteria matched a specific day, are sent to the students who have not yet responded to all of their surveys in the department.

For both introductory and reminder messages, the messages were sent to students using the “MegaMailer” service available on campus to manage the email load caused by a large number of emails sent at the same time. If necessary, messages can be sent manually by making use of the code and techniques mentioned above.

3.4 Gathering and Viewing Response Rates:

A minor modification of the code created by WebCT was used to generate reminder messages as well as for gathering response rates. The code to generate reminder messages identifies those students who have not yet responded to all surveys (which they have access to) in an evaluation space.

On the web site provided for department representatives, there is an option to determine the rates for every survey in their evaluation space. A list is generated for every survey and sent to the department representative via email.

3.5 Extracting Data for Processing:

WebCT created the bulk of the code for retrieving survey answers from the evaluation spaces. This code was customized to modify the output slightly. One file is created per evaluation space (department).

Each line in the file contains, in a delimited format:

- University course name and section (taken from the survey title)
- Survey type (Instructor, TA, etc)
- An arbitrary and unique number representing each student (allows unique identification of a given student's responses while maintaining privacy)
- The question type if available (e.g., MC for multiple choice)
- A survey question (the text)
- The number of the survey question (e.g., 24) as seen in the survey tool in WebCT
- The response to the question

Every survey and student in the WebCT space is represented in the file. However, each line contains only a single student response to a single survey question.

This output is sent to the Statistics Lab to analyze the data and produce reports for the departments and the College.

3.6 Automating Creation and Management

Initially all creation and configuration processes, except for setting survey release dates, were performed manually. This included, for each survey:

- Creating and naming the survey based on the template
- Setting the selective release criteria for the survey
- Creating an icon for the survey
- Linking the icon directly to the survey
- Setting the selective release and dates for that icon to match the survey selective release

Currently all of the above processes, except for creating and naming the surveys, are now automated (scripted). Once all surveys are created, scripts are run that finish the preparation and configuration of the spaces, including loading students into the space.

4. DATA ANALYSIS AND REPORTING

As the data collection process underwent a radical change, the data analysis and reporting process was also overhauled. Even though all departments in the College originally shared a common set of questions on the scan sheet, each department had slightly different reporting requirements – some evaluated TAs, some needed each instructor compared with others in similar level courses, etc. Over time, highly customized SAS programs were developed for each department, with the text of the questions hard-coded into the programs. This was a workable solution as long as the set of questions did not change; the high cost of printing custom scan forms encouraged this stability.

However, the greater flexibility of the online evaluation process makes it possible for departments to consider different types of evaluations, such as for lab TAs and graders.

In the current deployment, the original reporting styles have been replicated for each department. However, the creation of a core SAS program has begun that can be easily adapted to produce reports with minimal effort, even if the evaluation questions are changed.

The data file from WebCT includes the full text of each question. For multiple choice questions, the full text of each possible response is also included. This text information is read and used to automatically produce reports with appropriately labeled frequency counts and percentages.

Many of the multiple choice questions ask students to give a rating from Excellent (4) to Poor (0). These are automatically detected and used to compute means, standard deviations and coefficients of variation, in addition to the frequency distribution. These are also computed and used for comparisons with other sections of the same course, courses at a similar level and other groupings.

The online evaluation also permits open-ended questions. In the past, students could write comments on the scan sheet, but these responses had to be either transcribed by hand or reviewed by the instructor on the original paper. In the new system, these comments are automatically included in the computer generated reports for each class.

All of these reports are created as Adobe PDFs, using the Output Delivery System in SAS Version 9.1. SAS macro variables allow these to be automatically named and placed in the appropriate directory according to the semester and department. These files are then e-mailed to designated representatives in each department. (Alternately, the same Output Delivery System could generate the reports as html.) In addition, reports of the response rates by course and course level are also generated.

At this time, a separate SAS program exists for each department, although they now share this common core which reduces the hard-coded customizing and the manual updating each semester. In the future, this core could be used with almost no change even if each instructor wanted to have a set of course-specific questions (although clearly, this would not apply to questions used for comparisons across courses). It would also be easy to automatically create a separate PDF for, each instructor, as well as summaries for the department chair.

5. STUDENT RESPONSE RATES

Student response rate was the dominant measure the College used to determine success in the transfer from paper to online course evaluations. Below are the response rates for all three semesters.

Table 1. CMPS Online Course Evaluations Summer 2003 Pilot Summary

Course group	Number of course sections	Total number of students	Total number of responses	Response Rate
Computer Science	2	83	54	65%
Math	4	94	56	60%
Physics Instructor	5	101	19	19%
Physics TA	5	101	16	16%
Total	16	379	145	38%

Table 2. CMPS Online Course Evaluations Fall 2003 Pilot Summary

Course group	Number of course sections	Total number of students	Total number of responses	Response Rates
Astronomy	13	281	114	41%
Computer Science	149	3281	1411	43%
Geology	60	1027	443	43%
Math	111	2692	1161	43%
Meteorology	4	124	39	31%
Physics	319	5345	2446	46%
Total	656	12,750	5,614	44%

6. LESSONS LEARNED

6.1 Administrative Support

The first summer pilot provided feedback on the support tools created outside of WebCT (response tool and making the email tool easier to use). At the end of the Fall pilot, the department representatives wanted to limit the amount of email reminders that were sent to students during the Fall and depend on an Introduction email and a mid-way email that were sent from the Dean's office to students. The disparity of the response rates in the Spring as well as the lower percentages may have been related to this approach. Astronomy had a high response rate because they used extra credit for completed surveys as a motivator in their large introductory courses. They also sent additional email reminder messages to those sent out by the Dean's office. Physics sent more reminder emails and started sooner than the rest of the departments. They also offered a \$50 gift certificate in a lottery drawn from those students who completed evaluations. Geology changed department representatives; the representative did not understand how to use the tool and therefore, students were not receiving reminder emails through the tool available to department representatives.

In the debrief related to the Spring semester online course evaluations, the Associate Dean for Academic Affairs in the College stated that the Fall 2004 evaluation would be implemented consistently across the departments. The effort will be coordinated by a representative of the Dean's Office to ensure one introduction email, the same number of email reminders, and no incentives in terms of extra credit or lotteries be used by all departments. Faculty will be encouraged to announce the

evaluations a number of times and to explain the value of the evaluations to the University in its quest to improve teaching.

Table 3. CMPS Online Course Evaluations Spring 2004 Summary

Course group	Number of course sections	Total number of students	Total number of responses	Response Rates
Astronomy	57	1349	872	66%
Computer Science	117	3066	1019	33%
Geology	65	1129	281	25%
Math	408	8544	1450	17%
Math 003	18	173	19	11%
Meteorology	25	346	113	33%
Physics	247	5320	2438	46%
Total	937	19,927	6,192	31%

6.2 Technical Support

Time spent and errors committed while preparing and configuring the surveys can be reduced with more automation. A plan to create surveys based on the campus electronic Student Information System is the next major step in automating the process and making the solution scalable to more colleges at the University of Maryland.

In addition, much of the effort thus far has been aimed at providing appropriate access to students taking the surveys. More time also needs to be spent in improving the flow for students evaluating multiple courses (e.g. marking status, providing confirmation and clear navigation). Because WebCT was not designed specifically for this task, further modifications and creative solutions will be necessary to accomplish this task.

7. FUTURE OF THE PROJECT

The process and the technology continue to improve with each semester. Other Colleges have approached OIT to provide this online course evaluation option for them. A meeting with representatives from the Deans for all of the Colleges is scheduled in Fall 2004 to determine interest and support. Based on the results of the meeting, the campus implementation will move forward.