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SOS: A SUBJECT ONLINE SURVEY ENGINE TO SUPPORT IMPROVEMENT IN TEACHING AND LEARNING

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Abstract

Traditionally, data relating to the conduct of subjects at the University of Wollongong has been collected for academics with one main purpose in mind: to provide the academic with supporting information as to their teaching ability for the purposes of promotion. Currently this data is collected using 'prescribed Teaching Surveys'. The process is a formal, highly regulated mechanism and is administered by the Centre for Educational Development and Interactive Resources (CEDIR) on request. The promotion process requires that the academic provide of not less than 4 and no more than 6 such survey reports in their application for promotion. These surveys are seen as an imposition by many rather than a tool for improving the process of teaching and learning at the university. Two major difficulties have been identified. Firstly, the prescribed question set is not always appropriate and secondly the questions are too heavily weighted towards the academics performance as a teacher to provide useful information about the subject and its presentation which could be used to improve the quality of teaching and learning.

SOS is a web based system which provides a simple and intuitive interface through which academics can design and author customised surveys designed to collect information about the success or otherwise of the subjects that they provide for their students. These surveys may be completed anonymously by the students via the web and the data is automatically collated and returned to the academic. The academic may also produce the surveys in hard copy, for distribution and collation

SOS fulfils two perceived needs: providing a 'non-threatening' and 'informal' mechanism by which academics can obtain useful information about the subjects they develop and teach in terms of subject based criteria rather than the 'lecturer based criteria' of the formal Teaching Surveys. This information can be used to 'test out' new approaches to teaching and learning as well as subject delivery. With the University adopting a flexible delivery approach for both on and off campus students, there is also a need to gather data from the students point of view on the success or otherwise of this approach.

This paper provides a background to the development of SOS in the context of the needs of the University of Wollongong and it's academics. It presents an overview of the development of the system from the exploration of possible pre-existing systems, to the development of a specification, the evolution of a database of suitable questions and the trialing of the beta version. It also reports on the outcomes of these early trials that have involved a broad cross-section of faculties and departments across the University.

BACKGROUND

Traditionally, data relating to the teaching of subjects at the University of Wollongong has been collected for academics with one main purpose in mind: to provide the academic with supporting information as to their teaching performance for the purposes of promotion. Currently this data is collected using 'structured pre-set Teaching Surveys'. The process is administered by the Centre for Educational Development and Interactive Resources (CEDIR) and is available upon request. In its current form it is a formal, highly regulated process. Distribution and collection of the surveys is paper based and carefully monitored so that the academic does not have access to the completed survey forms. Marking is done mechanically by staff at UNSW and the results are posted to the academic. The academic may then approach academic staff at CEDIR for analysis and advice on the outcome. These surveys are perceived as an imposition by many academics rather than a means of collecting data that may be used to improve the process of teaching and learning at the university. This perception is supported by the fact that the prescribed question set is not always appropriate to the specific circumstances. Further, the questions are too heavily weighted towards the academic's performance as a teacher to provide useful information about the subject and its presentation, which information could be used to improve the quality of teaching and learning. The cost and time spent in producing, administering, scoring and disseminating the results of these surveys has over the past few years become a major drain on resources.

In 1998, the Director of CEDIR, Associate Professor Sandra Wills, secured funding to conduct research on the development of an 'informal' online survey system. This system could be used to provide academics with personal formative data on the success of their subjects from a student's perception, allowing them to improve teaching and learning outcomes for students without the need to resort to numerous and expensive formal Teaching Surveys. The research working party examined the online methods used to conduct teaching surveys by 15 Australian universities.

In summary the findings included:

- web sites which existed were designed specifically for that University and outlined the procedures and recommendations for that institution;
- generally, these sites are nothing more than a means of communicating that information;
- in some cases, the application for evaluation questionnaires is via the web, but the actual process involves the usual preparation and distribution by the body concerned;
- none are using the web exclusively to distribute and collate the data although some have taken ~~some~~ tentative steps towards this goal; and
- most surveys seem to consist of set questions plus optional, selected from item banks.

From this research the working party made several recommendations which later formed the basis of the specifications for the development of the Subject OnLine Survey (SOS). These included:

- the tool should be web based in terms of authoring of the surveys, distribution and completion, collation and return of data;
- the tool should comprise a simple intuitive interface which requires no knowledge of web based programming to use;
- there should be an item bank of 'standard questions' from which the academic may select as well as the ability to author individual questions;
- there should be a variety of questions types available such as Likert scale, True and False, Yes and No and open response; and
- there needs to be a concurrent staff development program to ensure appropriate and effective use of the system.

During the research phase, the Melbourne University Multimedia Education Unit's development of a generic evaluation tool LEO or Learning Evaluation Online was identified as a possible engine which could be relatively easily adapted to our purposes. The LEO software environment is a template using the OXYGEN (Object eXtensible analYsis and Generation of Education coNtent)

software engine developed by Albert Ip. The authoring capability of the OXYGEN software engine is extremely flexible, making it very adaptable for a wide variety of potential for uses, and users.

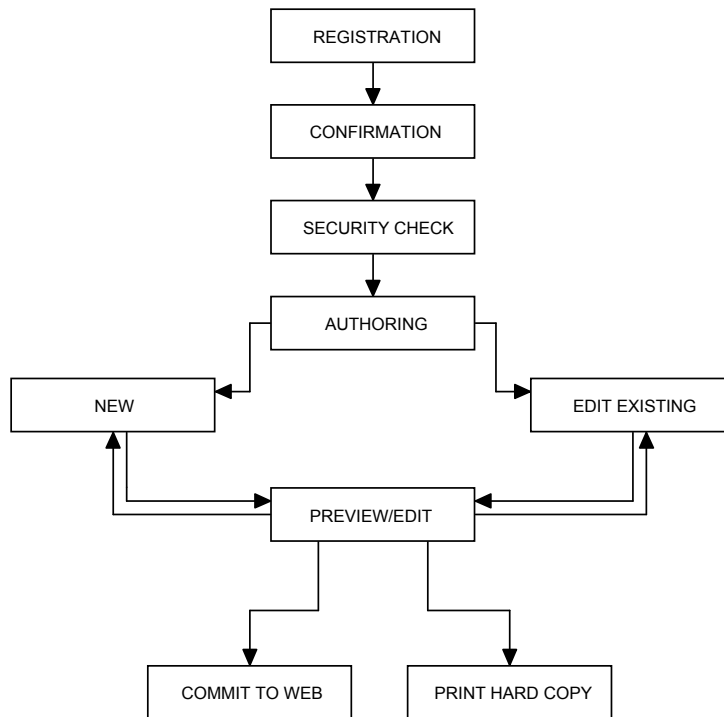
Learning Evaluation Online (LEO) was originally developed as a survey/ evaluation tool in response to a need for an asynchronous Web-based evaluation mechanism, that could be easily modified to suit a variety of potential respondents (eg. peer, student, multimedia developers, interface designers, etc.), and courseware from various content domains. SOS was developed using the LEO engine because it already contains some purpose built features common to our specification for SOS. These included:

- deliberately designed to be as content-free as possible—the content of every survey or questionnaire relied upon the survey author;
- several different pre-defined question styles, including Likert scales, True/false items, free text responses and;
- the ability to create fully customised question.

SUBJECT ONLINE SURVEY (SOS)

SOS is a web based system which provides a simple and intuitive interface through which lecturers can construct and author customised surveys designed to collect information about the success or otherwise of the subjects and/or subject components that they provide for their students. SOS fulfils two perceived needs. Firstly, it provides a 'non-threatening' and 'informal' mechanism by which lecturers can obtain useful information about the subjects they develop and teach in terms of subject-based criteria rather than the 'lecturer based criteria' of the formal Teaching Surveys. Secondly, it provides a means of gathering data from a student's viewpoint on the success or otherwise of the 'flexible delivery' approach being embarked upon by this University. This data could be used to 'test out' new approaches to teaching and learning as well as subject delivery.

The created survey is secure and password protected for the benefit of the lecturer. For security reasons, this, together with the survey 'id', is returned to the lecturer via e-mail, not via the web. This information is not only necessary to gain access to the authoring section of the system, but also to gain access to the data collection site, thus ensuring privacy. Also included in this email message is a text based file which contains a set of randomly generated numeric tokens which the lecturer may cut and paste to a text document and then may distribute to students randomly so that they may access and complete the survey. The number of numeric tokens produced is controlled by the lecturer when registering the survey. An overview of the authoring process is shown in Fig 1.



SOS Overview
University of Wollongong

Fig:1 SOS Overview

The stages of SOS for the lecturer (Fig 2) are:

- Registration - confirmation, security procedures
- Authoring – editing, previewing, committing either to the print mode or online mode
- Collecting the results from the online mode

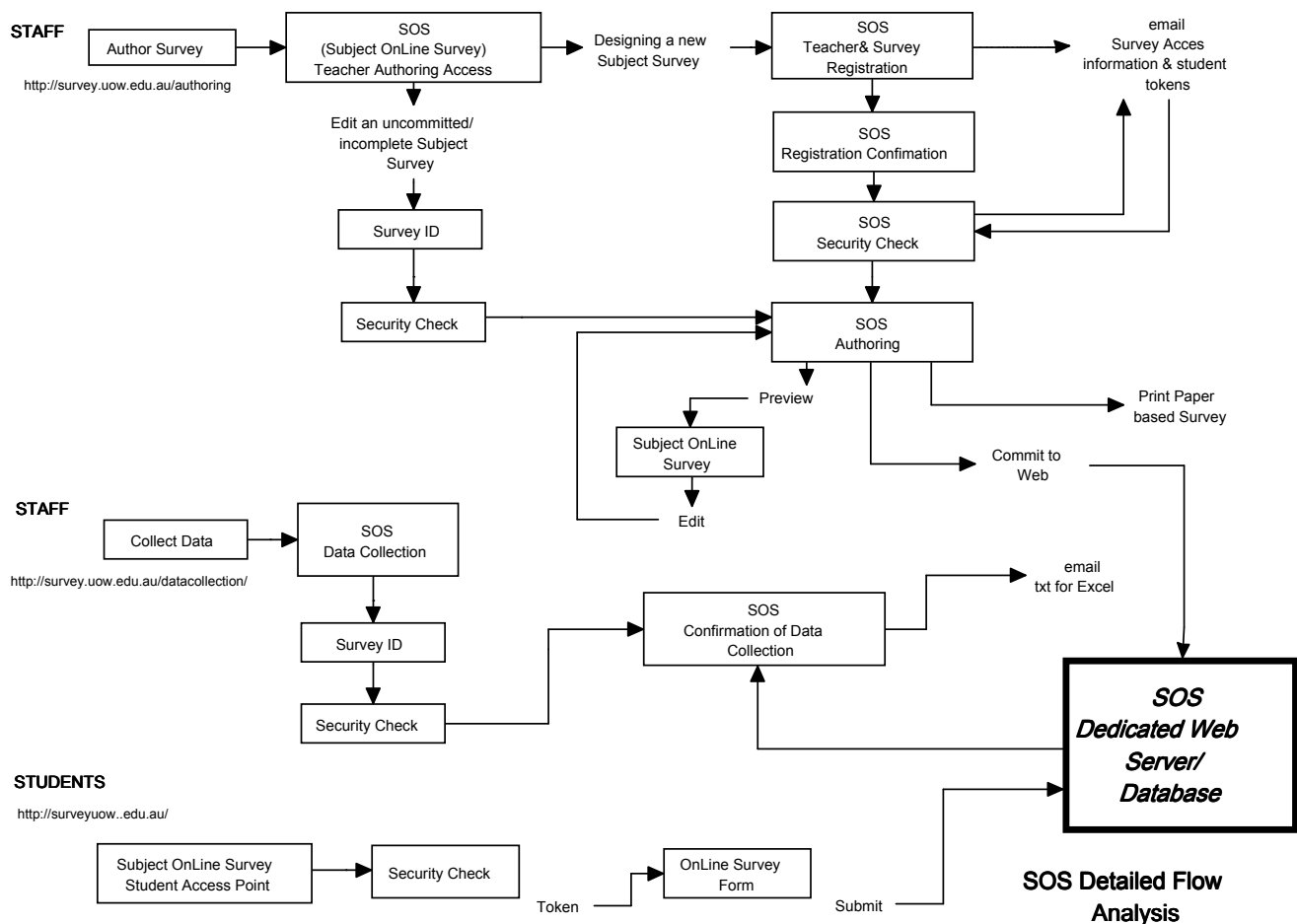


Fig 2 SOS Structure

During the authoring process the lecturer may select as many questions as required from a database which has been divided into five content categories:

- Design/Content/Integrating
- Teaching/Learning
- Modes of Delivery
- Teacher/Learner relationships
- Open-ended questions

The questions in each of these categories use a 7-step Likert scale response design.

The lecturer is also able to compose custom item questions for inclusion in the survey. They may choose from three response styles; Likert scale, True or False and Open written response.

When the lecturer is happy with their constructed survey, they may print copies for manual distribution and analysis or post it to the web for completion by students online. The advantage of the online approach is that the responses will be collated automatically by SOS and be available for viewing by both the lecturer and /or the students immediately.

If the online approach is chosen, SOS ensures that students can only respond to the survey once using the numeric tokens sent to the lecturer via email. This ensures that the surveys are completed anonymously by the students. It should be noted that the 'use by date' of the survey may also be set, but is by default, 100 days from the initial submission of the survey by the lecturer.

Students have access via a separate web site (see Fig 2) which is provided as a URL by the lecturer. To complete and submit the survey, they must enter the numeric token supplied to them by their lecturer, complete all questions and press the submit button.

The data collated by SOS is made available through two avenues. Firstly, using the data collection site, the lecturer may obtain the cumulative responses over the life of the survey and copy them into a spreadsheet program of their choice. If the lecturer has not accessed the data by the expiry date of the survey, the data collated at that time is automatically sent via email and the survey de-activated.

DEVELOPING A QUESTION DATABASE

During the research phase of this project our direction with respect to content categories, types and styles of questions to be included in the initial databases clarified. The Teaching Survey database previously in use within the university contained many hundreds of questions which were either directly suited or with modification could be used successfully. As ownership of these questions rests with the university, use and/or modification did not present an issue, allowing rapid completing and testing of a prototype. Many additional questions were added to take account of the University's decision to adopt WebCT as the standard web delivery environment.

EVALUATION

At the time of writing, the SOS system has been available for use by lecturers for a period of about six weeks. In this initial trial period, the system has been made available to three faculties within the university, Engineering, Commerce and Public Health. To date most of the surveys produced have been 'one off' tests by lecturers of the procedures and process. Use is being made by a lecturer in Public Health to obtain data on the students perceived differences of the effectiveness of on vs off campus delivery of a subject in the area of Public Health and Nutrition. The subject has been traditionally delivered on campus, but is being offered concurrently to a group of off campus students this semester. The actual number of surveys authored so far is small, but we expect that this will increase as the exposure to and training in the use of the system is extended to other faculties and the semester progresses.

The system is designed to collect data to assist in evaluation. Some of the information collected and stored centrally includes:

- the name and subject code for each survey;
- the question categories and numbers used in each survey;
- the number of students entered; and
- the number of students who responded.

Much of the evaluative data collected so far is in the form of comments and suggestions from users

A summary of the positive comments received about the SOS include:

- the simplicity of the authoring interface;
- the ease and speed of deployment of the survey;
- the ease of customisation for a variety of different student groups and needs;
- the quick turn around possible in comparison to a paper based survey; and
- the ease with which a 'non-computer' person can produce a useable product.

Lecturers who have use the system to date have identified the following possible weaknesses of the current version:

- the 'set' 7 point Likert scale, possibility of others being available;
- no mechanism for students to see aggregated results;
- no choice of background graphics at present; and
- the need to manually modify the data collected before exporting to a spreadsheet.

FUTURE DIRECTIONS

The initial intention of this project was that it should be an 'informal' and individual online survey system primarily aimed at allowing teachers to improve teaching and learning outcomes for students. However, it is already being seen as having potential benefits for subject and program coordinators. Coordinators could use the system to collect information over a range of subjects which make up a program, with the intention of improving the teaching and learning outcomes for the whole program, not just for a single subject.

There are also a number of areas in which the current version might improved and we will be examining the potential of several possibilities.

The database of questions that are available can be significantly expanded. The system is technically capable of handling a much greater capacity that it is currently and we can begin to include questions at a more subject/topic specific level than is currently the case.

As the number of questions and question-types grows, there will be a need to provide additional question categories, both to improve applicability to a wider campus community, and to organise the questions themselves into easily accessible question sets. This is to avoid users being forced to scroll through many questions to locate the ones that they want to use.

While retaining a generic question set, there is also the possibility of providing tailored question sets at the Faculty, department, subject, or even topic level. This would make the system even more appealing and, hopefully, retain its ease of use, and would allow special needs to be taken into account.

In the longer term, it is our intention that normative data on each question in the database be collected, collated and analysed.

An early extension that is being developed is the development of Excel macros, which will allow the importing of individual survey data. The resulting Excel spreadsheets will have built-in frequency counts, bar chart generation and cross-tabulation for preliminary data analysis. At the same time the availability of the raw data collected will remain available in either tab or comma separated form so that the user can import it into the application of their choice.

Finally, a program of staff training in developing an understanding of the application of the survey results to teaching could be designed and implemented.