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### Improving Teaching and Learning through Formative Evaluation: Using a Customised Online Tool to Collect Student Feedback

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# Improving Teaching and Learning through Formative Evaluation: Using a Customised Online Tool to Collect Student Feedback

## Abstract

Good teachers spend time reflecting on their teaching practice. What is working, what isn't - and more importantly, why is or isn't it? Such reflection is an essential component of maintaining and improving both teaching practice and the learning outcomes for students. Changes in current teaching practice towards more flexible teaching and learning environments and especially towards more student-centred online environments make this an even more important process. To answer this kind of question requires data which reflect the student's viewpoint on the teaching process and the time to collect and analyse it. As the subject itself is more and more likely to have some kind of online component, it is sensible to make use of the flexibility offered by an automated(??) online survey. In many institutions data on the success or otherwise of teaching and learning has been collected for teachers with one main purpose in mind: to provide the teacher with supporting information as to their teaching ability for the purposes of promotion. Often this data has a bias in its focus on the performance of the teacher, rather than the effectiveness of the pedagogies, delivery mechanisms and interactive strategies employed to provide a quality teaching and learning experience for both the teachers and the student. The Centre for Educational Development and Interactive Resources (CEDIR) at the University of Wollongong in association with the Multimedia Education Unit (MEU) at Melbourne University has developed an online tool to collect student feedback on these aspects of their experiences. The Subject Online Survey (SOS) is a cost and time efficient, web based system for collecting this feedback. Teachers can use it to design and author customised surveys to collect information about the success or otherwise of the subject they teach from a student viewpoint. These surveys may be completed anonymously by the students via the web (using randomly generated, survey specific numeric tokens) and the data is automatically collated and returned to the teacher. The teacher may also produce the surveys in hard copy, for manual distribution and collation. The system provides a 'non-threatening' and 'informal' mechanism by which teachers can obtain useful information about the subjects they develop and teach in terms of subject based criteria rather than the 'teacher based criteria' of the formal Teaching Surveys. In this time of declining University budgets, SOS provides a very cost efficient solution to the collection of this data. This paper provides a background to the development of SOS in the context of the needs of the University of Wollongong and its teachers. It briefly outlines the main features of the system and reports in detail on the outcomes for the early adopters in their teaching. Widespread use of the tool across the main campus and at our campuses at Nowra, Batemans Bay and Bega on the South Coast of New South Wales and at our Dubai campus has provided valuable recommendations for expanding and improving the system. We outline some of these new features being added to Version 2 including; faculty specific databases, online teacher feedback and the provision of 'standard' survey sets.

## Keywords

online survey, flexible delivery, teaching strategies, online delivery, student feedback, improving teaching, improving learning

## Disciplines

Arts and Humanities | Social and Behavioral Sciences

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# COMMUNICATION

## Improving Teaching and Learning through Formative Evaluation: Using a Customised Online Tool to Collect Student Feedback

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**Abstract:** *Good teachers spend time reflecting on their teaching practice. What is working, what isn't - and more importantly, why is or isn't it? Such reflection is an essential component of maintaining and improving both teaching practice and the learning outcomes for students. Changes in current teaching practice towards more flexible teaching and learning environments and especially towards more student-centred online environments make this an even more important process.*

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*The Centre for Educational Development and Interactive Resources (CEDIR) at the University of Wollongong in association with the Multimedia Education Unit (MEU) at Melbourne University has developed an online tool to collect student feedback on these aspects of their experiences. The Subject Online Survey (SOS) is a cost and time efficient, web based system for collecting this feedback. Teachers can use it to design and author customised surveys to collect information about the success or otherwise of the subject they teach from a student viewpoint. These surveys may be completed anonymously by the students via the web (using randomly generated, survey specific numeric tokens) and the data is automatically collated and returned to the teacher. The teacher may also produce the surveys in hard copy, for manual distribution and collation.*

*The system provides a 'non-threatening' and 'informal' mechanism by which teachers can obtain useful information about the subjects they develop and teach in terms of subject based criteria rather than the 'teacher based criteria' of the formal Teaching Surveys. In this time of declining University budgets, SOS provides a very cost efficient solution to the collection of this data.*

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*This paper provides a background to the development of SOS in the context of the needs of the University of Wollongong and its teachers. It briefly outlines the main features of the system and reports in detail on the outcomes for the early adopters in their teaching. Widespread use of the tool across the main campus and at our campuses at Nowra, Batemans Bay and Bega on the South Coast of New South Wales and at our Dubai campus has provided valuable recommendations for expanding and improving the system. We outline some of these new features being added to Version 2 including; faculty specific databases, online teacher feedback and the provision of 'standard' survey sets.*

## **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 teacher with supporting information as to their teaching performance for the purposes of tenure and promotion. The promotion process requires that the teacher provide between 4 and 6 recent survey reports in their application for 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. Scanning is done by staff at the Educational Testing Centre in Sydney twice per session and the results are posted to the teacher. Handwritten comments by students are kept at CEDIR until examination results have been released as the students' handwriting may be recognisable to the teacher and we need to ensure that students can comment free of fear of retribution. Previously students' comments had been re-typed by casual staff to maintain their anonymity but this approach became too costly. When the teacher receives their results they may approach academic staff at CEDIR for analysis and advice on the outcome.

These surveys are perceived as an imposition by many teachers 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 teaching 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. At one time it was compulsory for Course Coordinators to arrange Subject Surveys triennially, however the cost and time spent in producing, administering, scoring and disseminating the results of these surveys became a major drain on resources. In addition students complained about over-surveying and the usefulness of their feedback deteriorated. The students also complained, quite rightly, that they never saw the results of the survey. The timing of receiving the results means that students have usually moved on so it is difficult to distribute the results to them. But it would rarely happen anyway because teachers treat the surveys as confidential to themselves and are nervous even using them in Career Development Interviews with their Heads, let alone publishing them for students to see.

Although the triennial subject surveys were abolished, it was felt that new web-based technologies would enable us to design a more cost-effective and less centralised

procedure to replace it. In 1998, the Director of CEDIR, Associate Professor Sandra Wills, secured funding to conduct research on the development of an 'informal' online survey system. The goal of this system was to provide teachers with personal formative data on the success of their subjects from the 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 and although each had useful systems none provided a system which could be harnessed for our purposes. The Subject Evaluation kit developed by the Griffith Institute for Higher Education (GIHE) at Griffith University (Armstrong and Conrad, 1995) did however provide some very useful guides to question database development.

In summary the findings included:

- web sites which did exist were designed specifically for that University and outlined the procedures and recommendations for that institution;
- generally, these sites were 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 were using the web exclusively to distribute and collate the data although some have taken tentative steps towards this goal; and
- most surveys seemed 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 On-Line Survey (SOS). These included:

- the tool should be web based in terms of authoring, distribution, 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 would need to be a concurrent staff development program to ensure appropriate and effective use of the system.

During the research phase, we identified a generic evaluation tool LEO (Ip and Kennedy, 1999) or Learning Evaluation On-line 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 (Ip, 1998) of the University of Melbourne's Multimedia Education Unit.

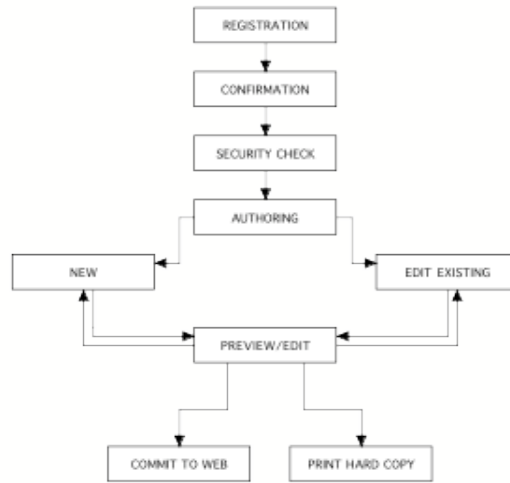
The authoring capability of the OXYGEN software engine is extremely flexible, making it adaptable for a wide variety of potential for uses, and users. Learning Evaluation Online (LEO) was originally developed as a survey/ evaluation tool in response to a need for an asynchronous Web-based evaluation mechanism, that could be easily modified to suit courseware from various content domains and a variety of potential respondents (e.g. peer, student, multimedia developers, interface designers, etc.). 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 questions.

### **Subject Online Survey (SOS)**

SOS is a web based system which provides a simple and intuitive interface through which teachers 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 three perceived needs. Firstly, it provides a 'non-threatening' and 'informal' mechanism by which teachers 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 efficacy of subject delivery. Third, in a time of declining university budgets, the costs of providing the service have been reduced by a factor of 60!

The created survey is secure and password protected for the benefit of the teacher. For security reasons, the password together with the survey 'id' is returned to the teacher 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. Only teachers at the University of Wollongong, ie those with a @uow.edu.au email address can access SOS. Also included in this e-mail message is a text based file which contains a set of randomly generated numeric tokens which the teacher may distribute to students in order to guarantee anonymity when they respond online. The number of numeric tokens provided is controlled by the teacher when registering the survey. An overview of the authoring process is shown in Fig 1.



**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

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

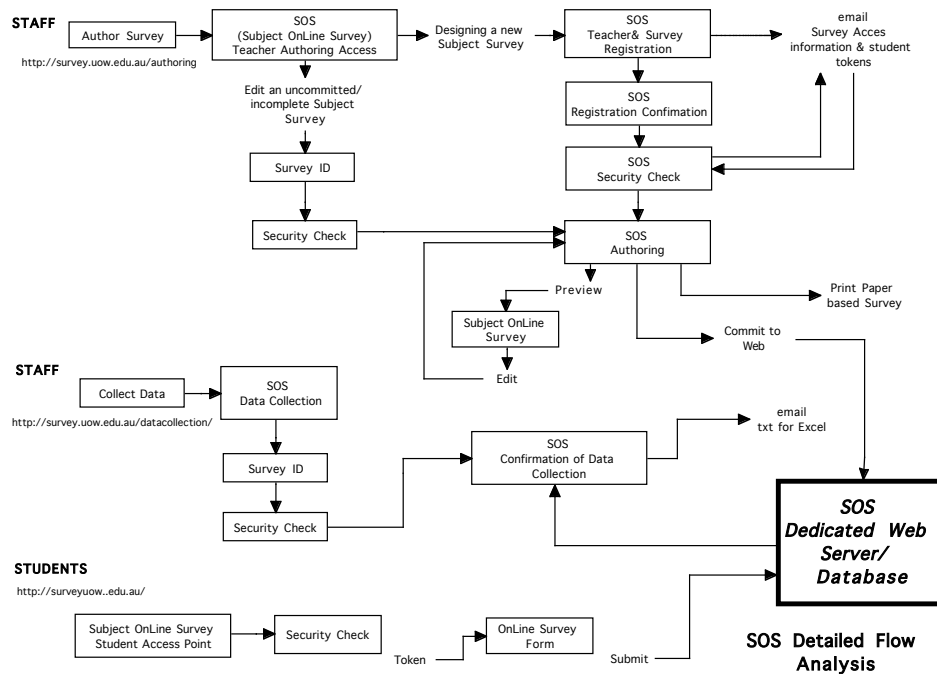
- Subject Organisation
- Teaching General
- Learning General
- Modes of Delivery
- Tutoring
- Labs/Demonstrations
- Integrated Academic Skills
- Teacher Learner Relationships
- Assessment/Feedback
- Open ended Questions
- Custom Items

The questions in each of the first 9 categories use a 7-step Likert scale response design.

The open ended questions are of the 'extended response' type and require the students to type within a text box, which scrolls to accommodate a lengthy response. The teacher is also able to compose custom questions for inclusion in the survey. They may choose from three response styles: Likert scale, True or False and Open written response.

When the teacher 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 teacher 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 it 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 teacher. To complete and submit the



**Fig 2 : SOS Structure**



survey, they must enter the numeric token supplied to them by their teacher, 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 is de-activated.

### **Developing a Question database**

During the research phase of this project we clarified the content categories, types and styles of questions to be included in the initial databases. 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 completion and testing of a prototype. Many additional questions were added to take account of a wider range of delivery options than the traditional lectures, tutorials, and laboratories. Questions now take account of team teaching, distance delivery, flexible delivery and online delivery plus the implementation issues for students associated with those modes such as their access to computers and modems. The University has adopted WebCT as the standard web delivery environment so questions can specifically raise WebCT-related issues.

### **Evaluation**

The evaluation of SOS during its development has had two main phases. The first phase involved its use by targeted users in specific faculties over a period of 4 months while phase two involved the collection of data from a full campus wide implementation of the beta version over the period December 1999 to June 2000.

#### ***Phase 1***

Version 1 initially took some 6 – 8 months in development and during this time a number of demonstrations both at faculty level, through the Faculty Education Committees, and to the general campus were provided to encourage early adopters to 'test' the system in the classroom environment. Teachers from the Faculties of Engineering, Commerce, Informatics and Public Health used the tool extensively during this period. One very useful implementation of the system occurred in the area of Public Health and Nutrition. A teacher within this area has used SOS extensively 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 results of these surveys for the basis for papers in preparation.

**Phase 2**

With campus wide availability and an extensive staff awareness and training program, the 'official testing' period December '99 to June '00 has seen in excess of 80 subjects (ranging in numbers of students enrolled from 10 to 350) and representing in excess of 5,500 students surveyed using SOS.

Completion rates for online surveys as opposed to those normally conducted at the close of a class by handing out and collecting survey forms before the students leave the room are comparable, with a slightly higher return rate for in-room based surveys. The authors suspect that this will change as students become aware of and comfortable with the online approach.

In March 2000, the University launched its new Shoalhaven Campus and South Coast Access Centres. Two whole degrees are being offered flexibly including online. As part of our evaluation strategy for the South Coast, all subjects have had SOS based evaluations conducted for the first semester and this data is at the time of writing still being analysed.

For on-going evaluation purposes, the system is designed to collect data automatically – one of the advantages of online technologies. 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 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;
- the ease with which a 'non-computer' person can produce a useable product;
- the perception of a 'smaller but richer' data return; and
- the perception that online completion allows more time to consider responses, resulting in more 'usable data'.

Teachers who have used 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;
- the need to manually modify the data collected before exporting to a spreadsheet;
- the limited data bases – currently general sets which do not address all faculties equally; and
- the lack of an online 'teacher or student feedback' mechanism.

### **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, its potential benefits for subject and program coordinators lead to its naming as SUBJECT On-line Survey. 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 be improved and we are investigating alternatives:

- The database of question that are available can be significantly expanded. The system is technically capable of handling a much greater capacity than 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 ready-made tailored question sets at the Faculty, department, subject, or even topic level. This would make the system more appealing and, hopefully, retain its ease of use, and would allow special needs to be taken into account.
- Implementation of access to the University's "Standard Teaching Survey" on-line. Currently this is a paper based service which must be 'booked' in advance.
- 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 in either tab or comma separated form so that the user can import the application into the application of their choice.

- Finally, the program of staff training needs to be extended to include developing an understanding of the application of the survey results to teaching.

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