Use of electronic surveys in course evaluation

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Abstract
The growth of e-Universities and flexible delivery in higher education may also lead to increased use of electronic course evaluation methods. The effectiveness and methodology of electronic surveys are discussed. In the graduate-entry, problem-based University of Sydney Medical Program extensive use is made of web technologies for curriculum delivery and evaluation. The design and response rates for web-based “End of Year” student evaluation surveys in the medical program are reported for the period 1997–2001. To be used successfully in course evaluation, online surveys should be infrequent, short, simply designed and free from password access, and de-identified results should be displayed to students on their completion of a survey.

Introduction
Student evaluation surveys are the most widely used measures of course quality in higher education (Ashcroft and Foreman-Peck, 1994; Husbands and Fosh, 1993; McKone, 1999; Saroyan and Amundsen, 2001). Continuing growth in the use of web technologies to support teaching and learning in universities (Mayes, 2001), may also lead to large-scale replacement of paper student evaluation surveys with electronic versions. Surveys are the most effective means of gauging consensus among students and identifying trends.

In this article we review evidence for the effectiveness of electronic surveys, and discuss issues in email and web survey methodology. We describe the successful use of web-based surveys in the evaluation system of the University of Sydney Medical Program (USydMP), and conclude with several recommendations for online survey use in course evaluation.
Email web-based surveys

Email is an alternative means of distributing surveys to an online population. The survey may comprise the body of the email itself (useful only for very short surveys) or be web-based and

1. embedded in the body of an email, or
2. accessible via a hotlink.

Email and web technologies provide an immediate means of returning surveys. Sheenan and McMillan (1999) found that it takes respondents an average of 7.6 days to return an email survey compared with 11.8 days for a postal survey. Paper resource use savings decrease costs by 80–95% (Sheenan and Hoy, 1999; Weible and Wallace, 1998; Watt, 1999), although “hidden costs” such as those associated with the design of a survey, and/or the operation and maintenance of the computer network, need to be taken into account (Yun, 2000). Compared to a mail survey however, the cost per questionnaire of web-based surveys decreases as survey size increases (Yun, 2000). Other advantages attributed to the use of online surveys are the tendency for respondents to respond more fully to open ended questions (Yun, 2000; Bachmann et al, 1999), and the ability of researchers to immediately provide respondents with the latest aggregate results (Yun, 2000), which in turn may encourage greater participation. Tse (1998) argues that in comparison to paper surveys, email surveys:

- are cheaper
- eliminate tedious mail processes
- are faster in transmission
- are less likely to be ignored as junk mail
- encourage respondents to reply
- can be construed as environmentally friendly.

However, there is conflicting evidence concerning response rates for electronic versus paper surveys. Several studies show low response rates for email and web-based questionnaires. Kwak and Radler (2000) obtained a response rate of 42% for mail and 27% for email in a sample of college students. Guterbock et al (2000) achieved 48% for mail and 37% for web-based; similarly, Medlin et al (1999) achieved 47% for mail and 28% for email. Crawford et al (2001) achieved a 34.5% response rate in a college web-based survey, while Ranchhod and Zhou (2001) obtained just 6% in an email survey compared with 20% in a mail survey.


Conversely, other studies have shown high response rates with email surveys: Parker (1992) achieved 60% in an email survey versus 38% for an identical mail survey, Kiesler and Sproull (1986) achieved 67% and Walsh et al (1992) obtained a 76%
response rate. In the USydMP, at the time of writing, we have obtained an average response rate of 64% since web-based survey use began in 1998.

It may be that the specific context in which a survey is used, survey methodology and the nature of the survey population have more influence on response rate than the type of survey, ie, paper or electronic by itself. On the other hand, not all students (and/or staff) may have easy access to web technologies, and the nature of email and the Internet, discussed below, creates a new set of challenges for respondents (Crawford et al., 2001).

**Web-based survey methodology**

There are clearly fundamental differences between electronic and paper surveys. Web-based surveys by necessity must be completed at a computer terminal. Surveys cannot be easily put aside to be completed in a different location at a user’s inclination, and if a respondent wishes to complete a survey at a later time, then it is more difficult to “pick up” the survey again. It requires the respondent to return to a computer, log on, and rediscover the email or URL where the survey is located. It is more difficult for surveys to be completed in two sittings—an important issue for survey length.

As a result of the high volume and speed of information flow that characterises the web, Internet “savvy” users may have a shorter attention span than paper users, and there may be more distractions especially when other web pages are open at the same time. While email surveys are cheaper for the researcher, the cost of the survey is effectively passed on to the respondent who may have to pay for Internet access, download time or number of pages accessed. There is the additional danger with online surveys of viruses being transferred via email attachments. Consequently, users are often reluctant to open mail from an unknown sender. Notwithstanding the recent anthrax scare, this is generally not an issue with mail surveys. While Tse (1998) suggests that email surveys are less likely to be construed as junk mail, the sheer volume of email that is received by people means that users are again reluctant to waste time opening mail from unauthorised senders (Crawford et al., 2001; Ranchhod and Zhou, 2001).

Factors that may affect email survey response rates once a survey has reached and been opened by the potential respondent include:

1. completion time indicated in the invitation,
2. timing of the reminder notice,
3. access to the survey,
4. perceived anonymity and confidentiality of responses, and
5. reward.

Crawford *et al.* (2001) investigated whether the time stated in the invitation, timing of reminder notices, and use of a password access affected the response rates of an online questionnaire in a sample of college students. Results were that if students were told the survey would take 8–10 minutes, then they were more likely to begin the survey than if they were told it would take 20 minutes (average completion time was 19.5 minutes).
However, higher attrition rates during the survey negated the difference in response rates overall. The results imply that to maximise response rates the questionnaire should be as short as possible, and the time estimate in the invitation should be realistic to minimise dropouts. With regard to an email reminder notice, for respondents who were reminded after two days, the completion rate was 30.3%, while for respondents reminded after five days, it was 24.3% (p < 0.05). Additionally, the return rate was faster for those respondents reminded at two days (Crawford et al., 2001). The importance of following up email surveys more quickly than mail surveys is reiterated by Yun (2000). In general, a two-day reminder notice is suggested. Some researchers (e.g., Mehta and Sivadas, 1995) have found improved response rates with four contacts, whereas Kittleson (1997) had no further improvements with third and fourth contacts. In addition to follow up notices, prenotification has produced variable results (Sheenan, 2001). Mehta and Sivadas (1995) suggest prenotification for email surveys is imperative to avoid sending unsolicited surveys.

In the Crawford et al. study, password access was found to have a small but significant effect on response rate, so that those students who had to type in a password that was included in the invitation email had a higher non-response rate (67.8%) than the automated password entry group (63.2%) (p < 0.01). The authors hypothesise that the more complicated access may have filtered out less motivated respondents. They found no difference in the quality of data collected (length of open-ended responses), indicating that there may be no difference in the perceived confidentiality added by having a password entry screen. It is likely that the password screen increased the difficulty of accessing the survey and thus decreased the response rate.

Several researchers have indicated that ease of access to the survey page is important. Dommeyer and Moriarty (2000) for example showed that an embedded survey, which was easy to access, had a response rate five times higher than an attached questionnaire that was more difficult to access. Ranchhod and Zhou (2001) recommend the use of plain and simple designs, to minimise download time and reduce the need for complex Internet skills to navigate the form. Principles of good paper questionnaire design also apply to online surveys: items should have simple sentence constructions, be positively worded, and ask only one question (Peat, 2001).

A lack of anonymity in the use of some email surveys has also been suggested as a reason for low response rates (Kittleson, 1995; Ranchhod and Zhou, 2001). There are two factors to be considered here: the willingness of the respondent to have their answers identified, and the ability of the researcher to follow up non-responders efficiently. Whereas in mail surveys, personal privacy is reasonably secure, administrators or any person with sufficient computer knowledge can track password-access users. Especially where a survey is returned via email, the sender is easily identified by their email address. Alternatively, if responses are made anonymous by, for example, using a web-based survey with no password access, then there is no way to follow up non-responders or to prevent people from completing the survey multiple times.

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Some researchers have identified the lack of reward possibilities (e.g., pens, vouchers, gifts) when using the Internet as a reason for lower response rates compared with mail surveys (Mehta and Sivadas, 1995; Dommeyer and Moriarty, 1999). We suggest that the display of survey results upon completion of the survey somewhat addresses this concern, especially if the results can be individualised (where relevant) to the respondent.

In the next section, we discuss the issues of response rate and sample representativeness in relation to successful email survey use in the USydMP.

Web-based survey use in the University of Sydney Medical Program

The graduate-entry, four-year USydMP is built around problem-based learning (PBL), supported by lectures and other teaching sessions. The program makes extensive use of a web-based intranet for curriculum delivery in individual and group learning contexts (readers may explore the program web site at http://www.gmp.usyd.edu.au/visitors/) (Carlile et al., 1998; Barnet et al., 1999).

Every student in the medical program is assigned an email address for personal use as well as receiving official notices from the Faculty. Students have the option of using a web mail system that allows a user the flexibility to access email from terminals at multiple sites (e.g., home, tutorial room, computer lab, teaching hospital).

The student-centred course evaluation system in the USydMP uses a variety of methods, including intranet feedback mechanisms, regular feedback meetings with student representatives, and web-based surveys (Hendry et al., 2001).

Web-based surveys that are distributed to students include:

- an “End of Year” questionnaire
- PBL tutor evaluation forms (PBL groups change their tutor for each unit of study)
- occasional surveys, such as the “Learning Strategies Questionnaire” (Dean and Hendry, 2001)
- surveys from researchers outside the Faculty who wish to include medical program students in their sample. (These surveys must be approved by the Faculty Evaluation Committee to ensure that the research is ethical and of good quality, and students are not over-surveyed.)

In this article, we focus on the End of Year questionnaire as an example of an online student evaluation survey. The survey is an anonymous, rating-scales only web survey sent to all students toward the end of each year, using their medical program email addresses. The email invites students to complete the questionnaire, and requires a respondent to click on a hotlink to a web site where the questionnaire is stored. The invitation email informs students what the questionnaire is about, gives the number of questions in the survey and an estimate of how long the survey will take to complete. The invitation also indicates that students will be able to view the latest aggregate results once they have completed the survey.
When a student clicks on the hotlink to the site, a simple text-only questionnaire appears. All of the questions are on the one site so there is no additional download time between questions. Students are required to scroll through the questions and “click” on a radio button or check box to answer. Once the survey is completed, a “submit responses” button located at the bottom of the page is accessible for students to click and submit the survey. If questions have been left out, then the survey will not be accepted, and will reappear on the screen indicating which questions need to be completed before the survey will be accepted. Once the survey has been submitted, students are immediately able to view the latest aggregate, de-identified results for each question displayed as percentages and coloured bars. Appendix A lists the items in the Year 1 End of Year Questionnaire.

Response rate
At the time of writing, response rates for End of Year questionnaires, with a reminder sent one week later, average 64%. In comparison to the response rates for email surveys reported in the literature this is a good response rate. Table 1 lists response rates for the End of Year questionnaire since the inception of the medical program in 1997.

In the USydMP students somewhat accept that evaluation is a key part of the program, hence they expect to receive surveys (no prenotification is used). Students are invited to become partners in evaluation, to take part in the ongoing cycle of curriculum improvement for their own short term benefit and the benefit of future students.

While it appears the majority of students in the USydMP are willing to complete formal requests for feedback such as End of Year surveys, lower response rates to the Learning Strategies Questionnaire (46% and 15% at the beginning and end of 2001 respectively) may indicate that students are less inclined to fill out what may be perceived as less important questionnaires. Alternatively the difference in response rates could be due to the length and/or design of the questionnaire (the Learning Strategies Questionnaire contains 28 items).

Inevitably, there will be a degree of responder bias to any survey, mail or email, related to respondents’ interest in the topic and motivation to respond. For example, students who have had very good or very bad course experiences are more likely to feel compelled to respond than those whose experiences have been unremarkable.

Sample representativeness
The sample representativeness for email surveys in the USydMP is likely to be quite good. The population is well defined as all students in a particular cohort or “class”. By necessity, students in the medical program are well skilled in the use of the Internet and as such are ideal candidates for participation in online research (Crawford et al., 2001). Although it is likely that students’ use of their email accounts is very high, some students who receive and see the email invitation to participate in survey may not necessarily open it. It is not known what determines which email messages are opened, but common sense tells us it is likely to be a function of...
Table 1: Summary of response rates for “End of Year questionnaire” surveys University of Sydney Medical Program 1997–2001

<table>
<thead>
<tr>
<th>Calendar year</th>
<th>Academic year</th>
<th>Survey length (no. of items)</th>
<th>Method of distribution</th>
<th>Number of respondents</th>
<th>Response rate %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>1</td>
<td>38</td>
<td>machine-readable paper survey distributed to PBL groups</td>
<td>124</td>
<td>89</td>
</tr>
<tr>
<td>1998</td>
<td>1</td>
<td>10</td>
<td>Emailed embedded hotlink</td>
<td>104</td>
<td>68</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>14</td>
<td>paper survey distributed at students’ teaching hospitals</td>
<td>64</td>
<td>46</td>
</tr>
<tr>
<td>1999</td>
<td>1</td>
<td>9</td>
<td>Emailed embedded hotlink</td>
<td>134</td>
<td>67</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>16</td>
<td>Emailed embedded hotlink</td>
<td>88</td>
<td>61</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>25</td>
<td>Emailed embedded hotlink</td>
<td>81</td>
<td>68</td>
</tr>
<tr>
<td>2000</td>
<td>1</td>
<td>10</td>
<td>Emailed embedded hotlink</td>
<td>171</td>
<td>81</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>12</td>
<td>Emailed embedded hotlink</td>
<td>88</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>21</td>
<td>Emailed embedded hotlink</td>
<td>84</td>
<td>63</td>
</tr>
<tr>
<td>2001</td>
<td>1</td>
<td>14</td>
<td>Hotlink on website home page</td>
<td>147</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>15</td>
<td>Hotlink on website home page</td>
<td>139</td>
<td>64</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>19</td>
<td>Hotlink on website home page</td>
<td>126</td>
<td>63</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>17</strong></td>
<td><strong>112</strong></td>
<td></td>
<td><strong>64</strong></td>
<td></td>
</tr>
</tbody>
</table>

1. the perceived importance of the message,
2. the sender’s identity,
3. the volume of mail received at the same time, and
4. the receiver’s time constraints.

Surveys are generally sent by one of us (GDH), but occasionally by other members of the Faculty. Students in Years 1 and 2 also receive other messages from one of us (GDH), including a weekly feedback summary which, according to personal communications (JM), many students no longer read each week. The message title will indicate that the email is about a different subject, if a student gets that far without deleting the message.
A known name gives an email a formal quality and will lessen anxiety regarding viruses for example, but may be a disadvantage if other “non-salient” messages are received under the same name. Interestingly, the PBL tutor evaluation form, which is sent at the end of each unit of study by a different staff member, is titled “Please don’t delete!”—an indication of the difficulties of getting students’ attention within such a fast-paced medium.

The range of requests for surveys to be completed is likely to be a factor determining whether students will participate, and the number of surveys sent by the Faculty is kept to a minimum to prevent “survey fatigue”. Reassuringly, Hendry et al (2001) indicate that only 15–22% of students in the USydMP feel they are subject to too much evaluation.

In 2001, for the first time, the hotlink for an End of Year survey was broadcast within a “bulletin” on the medical program home page. This change was made to enhance ease of access for students, since many people check the home page daily, but may open their email less regularly. It also avoids the problem of habituation to an email sender’s name, although in the future habituation could be simply transferred to bulletin titles.

**Conclusion**

Increased use of web technologies to support teaching and learning in higher education may also lead to increased use of web-based student evaluation surveys. In a student-centred responsive evaluation system, surveys provide an essential source of information about changes in the quality of teaching and/or a course over time.

Based on the research evidence reviewed above, and our experience with the use of email surveys in the USydMP, for online student evaluation surveys to be used successfully in course evaluation we suggest that:

- students be given access to email accounts at no cost
- ease of access be maximised, eg, by embedding the survey in an email
- surveys be anonymous (ie, password access not be required)
- survey length be minimised (this applies to paper surveys as well)
- survey design be simple (also applies to paper surveys)
- students be given a realistic estimate of survey completion time (also applies to paper surveys)
- aggregate, de-identified results be displayed to a student on his or her completion of the survey
- a two-day email reminder be used
- the number of surveys sent per time period be minimised.

Overall, in comparison to paper surveys, electronic surveys are more cost effective, can be administered faster and allow rapid calculation of results for timely distribution to both students and staff. When used successfully, web technologies may thus enhance the capacity of teachers to respond to students’ feedback and effectively implement any course improvements.

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References


Appendix: Year 1 end of year questionnaire

The purpose of this questionnaire is to collect your perceptions about this year in the Medical Program.

There are 14 questions and it should only take you about 5 minutes to complete.

Once you have completed the questionnaire, you will be able to view the results to date.

1. My PBL groups have worked well
2. My PBL tutors have been good facilitators of the clinical reasoning and group process
3. All things considered, teaching and learning in Basic and Clinical Science sessions was effective
4. All things considered, teaching and learning in Community and Doctor sessions was effective
5. All things considered, teaching and learning in Personal and Professional Development sessions was effective
6. All things considered, teaching and learning in Evidence-based Medicine was effective
7. All things considered, teaching and learning in lectures was effective
8. Communication skills tutorials were useful for my learning
9. Physical examination skills tutorials were useful for my learning
10. Sessions in the Clinical Skills Centres were useful for my learning
11. The formative Objective Structured Clinical Examination was set at a fair level
12. The written formative assessment was set at a fair level
13. Our learning experiences and the course have been over evaluated
14. Please indicate your Clinical School: 1 Canberra 2 Central (Concord) 3 Central (RPAH) 4 Northern 5 Western (Nepean) 6 Western (Westmead)

Scale: Strongly agree, Agree, Undecided, Disagree, Strongly disagree, Not applicable