

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.

Response rates for email surveys appear to have declined as email has increased in popularity. Sheenan (2001) examined response rates for email surveys since 1986 and found a decline from an average of 46% in 1995/1996 to 31% in 1998/1999. Bachmann *et al* (1999) noted a similar drop in response rate for an identical survey completed in 1995 and again in 1998.

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 (eg, 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.

Some researchers have identified the lack of reward possibilities (eg, 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 (eg, 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

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

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.

References

- Ashcroft K and Foreman-Peck L (1994) *Managing teaching and learning in further and higher education* The Falmer Press, London.
- Bachmann D P, Elfrink J and Vazzana G (1999) Email and snail mail face off in rematch *Marketing Research* **11** (4) 11–17.
- Barnet S, Dolling T, Field M and Ryan G (1999) Design of online support for problem based learning in the practice environment *Paper presented at the Association for Learning Technology Conference Bristol September*.
- Dean S J and Hendry G D (2001) Levels of student self-regulation of learning in the graduate-entry problem-based medical program: does PBL enhance self-regulated learning? *Presentation at the College of Health Sciences Ed-Health Conference Sydney November 12–13*.
- Dommeyer C J and Moriarty E (1999) Comparing two forms of an email survey: embedded vs attached *International Journal of Market Research* **42** (1) 39–50.
- Guterbock T M, Meekins B J, Weaver A C and Fries J C (2000) Web versus paper: A mode experiment in a survey of university computing *Paper presented at the annual meeting of the American Association for Public Opinion Research Portland Oregon May*.
- Hendry G D, Cumming R D, Lyon P M and Gordon J (2001) Student-centred course evaluation in a four-year problem based medical program: issues in collection and management of feedback *Assessment and Evaluation in Higher Education* **26** (4) 327–339.
- Husbands C T and Fosh P (1993) Students' evaluation of teaching in higher education: experiences from four European countries and some implications of the practice *Assessment and Evaluation in Higher Education* **18** (2) 95–114.
- Kiesler S and Sproull L S (1986) Response effects in the electronic survey *Public Opinion Quarterly* **50** 402–13.
- Kittleston M J (1995) An assessment of the response rate via the postal service and email *Health Values* **19** (2) 27–37.
- Kwak N and Radler B T (2000) Using the web for public opinion research: a comparative analysis between data collected via mail and the web *Paper presented at the annual meeting of the American Association for Public Opinion Research Portland Oregon May*.
- Mayer J T (2001) Quality in an e-University *Assessment and Evaluation in Higher Education* **26** (5) 465–473.
- McKone K E (1999) Analysis of student feedback improves instructor effectiveness *Journal of Management Education* **23** (4) 396–415.
- Medlin C, Roy S and Ham Chai T (1999) World Wide Web versus mail surveys: A comparison and report *Paper presented at ANZMAC99 Conference: Marketing in the Third Millennium Sydney Nov/Dec*.
- Mehta R and Sivada E (1995) Comparing response rates and response content in mail versus electronic mail surveys *Journal of the Market Research Society* **37** (4) 429–39.
- Parker L (1992) Collecting data the email way *Training and Development* **46** (7) 52–54.
- Peat J K (2001) *Health science research: A handbook of quantitative methods* Allen and Unwin, Crows Nest.
- Ranchhod A and Zhou F (2001) Comparing respondents of email and mail surveys: understanding the implications of technology *Marketing Intelligence and Planning* **19** (4) 245–262.
- Saroyan A and Amundsen C (2001) Evaluating university teaching: time to take stock *Assessment and Evaluation in Higher Education* **26** (4) 341–353.
- Sheenan K (2001) Email survey response rates: a review *Journal of Computer Mediated Communication* **6** (2).
- Sheenan K B and Hoy M G (1999) Using email to survey internet users in the United States: methodology and assessment *Journal of Computer Mediated Communication* **4** (3).
- Sheenan K B and McMillan S J (1999) Response variation in email surveys: an exploration *Journal of Advertising Research* **39** (4) 45–54.
- Tse A C B (1998) Comparing the response rates response speed and response quality of two methods of sending questionnaires: email vs mail *Journal of the Market Research Society* **40** (4) 353–62.

- Walsh J P, Kiesler S, Sproull L S and Hesse B W (1992) Self selected and randomly selected respondents in a computer network survey *Public Opinion Quarterly* **56** 241–244.
- Watt J H (1999) Internet systems for evaluation research in Gay G and Bennington T L (eds) *Information technologies in evaluation; social moral epistemological and practical implication* Jossey-Bass, San Francisco, 23–44.
- Weible R and Wallace J (1998) The impact of the Internet on data collection *Marketing Research* **10** (3) 19–23.
- Yun G W and Trumbo G W (2000) Comparative response to a survey executed by post email and web form *Journal of Computer Mediated Communication* **6** (1).

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