[1]Comparison of Three Tobacco Survey Methods with College Students: A Case Study

Delores C.S. James, Ph.D., W. William Chen, Ph.D., CHES, & Jiunn-Jye Sheu, Ph.D.

All authors are affiliated with the Department of Health Education and Behavior, University of Florida
Corresponding Author: Delores C.S. James, Department of Health Education and Behavior, P.O. Box 118210, Room 5 Florida Gym, University of Florida, Gainesville, Florida, 32611; phone: (352) 392-0583, ext 1276 ; fax: (352) 392-1909; e-mail: djames@hhp.ufl.edu

Submitted May 30, 2005; Revised and Accepted June 18, 2005

Abstract

The goals of this case study were to: (1) determine the efficiency and effectiveness of three survey methods—postal mail survey, web-based survey, and random in-class administration survey—in assessing tobacco-related attitudes and behaviors among college students and (2) compare the response rate and procedures of these three methods. There was a large disparity in response rate between the three survey methods. In-class administration had the highest response rate (66%), followed by postal mail survey (23%) and web-based survey (10%). Based on the results, we recommend in-class survey administration with random class selection for conducting survey research on college campuses. This method appears to be efficient, productive and simple, and does not allow for the occurrence of many of the difficulties that commonly arise when other modes are used.

Key Words: tobacco; survey methodologies; web-based survey

Introduction

Survey research is often used to evaluate health education and health promotion projects, particularly among college students. The goals of this case study were (1) to determine the efficiency and effectiveness of three survey methods - postal mail survey, web-based survey, and random in-class administration survey - in assessing tobacco-related attitudes and behaviors among college students and (2) to compare the response rate and administrative procedures of these three methods.

College-aged students are the youngest population able to legally purchase tobacco products and are, therefore, a major target for the tobacco industry. Many states have partnered with colleges and universities to reduce tobacco use among college students **(**1). The anti-tobacco programs and activities conducted on college campuses usually are evaluated for effectiveness, efficiency, and fidelity to program goals and objectives. A survey research was conducted as part of a comprehensive evaluation of the anti-tobacco program.

The Florida Annual Tobacco Survey (FACTS) is used to assess tobacco-related attitudes and behaviors among college students in Florida. The Florida Department of Health, Division of Health Awareness and Tobacco, sponsors an annual project, Student Tobacco Reform Initiative- Knowledge for Eternity (SRIKE) aimed to reduce tobacco use and improve tobacco-free environment among college campuses in Florida. During the 2001-2002 school year, this survey was administered via three modes: postal mail survey, web-based survey, and random in-class administration survey. Each survey method was examined via literature review for advantages, disadvantages, general utility, and generalizability of data. Guidelines for various survey methods then were developed to maximize the response rate.

Methods

Instrument

The questionnaire used in the study was developed based on the goals and objectives of the College Advisory Initiative (CAI), previous FACT questionnaires, feedback from the anti-tobacco program coordinators, and the college tobacco-use literature. This instrument consisted of 43 questions and 146 items (variables) that assessed demographic data, tobacco knowledge, attitude towards tobacco, college and university policies use, and personal tobacco use. The Institutional Review Board of the University of Florida approved the project.

The instrument was reviewed by an expert panel for "clarity of instructions," "reliability and utility," "adequacy and appropriateness of questions and responses," and "layout and attractiveness." The reliability of the current FACTS survey was established with a pilot study using a test-retest reliability method with seventy-eight students enrolled in a Personal and Family Health Class. Correlation coefficient (*r*) ranged from .80 to 1.0 for demographic and background questions. Kuder and Richardson 20 (K-R 20) at .97 indicated a high level or reliability for knowledge questions. Both test-retest reliability and Chronbach's alpha coefficient were used to establish the reliability of the attitudes questions. Test-retest reliability indices showed high significance level ($p < .001$) on each of the questions (*r* ranged from .53 to .70).

Procedure and Sample Selection

Eleven colleges and universities in the state university system participated in the study. Three hundred students were randomly selected from each school for participation. Each institution selected one of the three survey methods that best suited their institution's need, based on level of technology, staff time, and other factors. The registrar from each school generated the random lists of students for schools that used mail surveys and web-based surveys. Each school was asked to send a letter or email to students to notify them of the upcoming study and to encourage participation. Mails surveys were sent to home rather than campus addresses. They also were asked to use follow-up measures such as phone calls, letters, or email to increase response rate. Guidelines for conducting postal mail survey are listed below.

Guidelines for Conducting Mail Survey (FACTS)

1. Obtain names, classifications, mailing addresses, and telephone numbers of 300 randomly selected students from your campus.
2. Send a copy of the sample list to the evaluation team.
3. Send a postcard to selected students one week before the survey. The post card should include

information about the STRIKE program and ask for students support to complete a questionnaire. The message should also include any incentives you plan to use to encourage completion of the survey.
4. Receive a package of 300 printed survey forms from the evaluation team.
5. Site coordinator and staff should attempt to complete the survey first to experience the time it takes to complete the survey.
6. Mail a copy of the survey to each selected student with a self addressed and stamped return envelope.
7. Collect and mail the completed surveys back to the evaluation team.
8. A list of students who have not completed the survey will be provided to each site for follow up.

Students who received the web-based surveys received an email and an individualized personal identification numbers that functioned as passwords to the online survey. Guidelines for conducting web-based survey are listed below.

Guidelines for Conducting Web-Based Survey (FACTS)

1. Obtain names, classifications, email addresses, street addresses, and telephone numbers of 300 randomly selected students from your campus.
2. Send a copy of the sample list to the evaluation team.
3. Send an email or a postcard to selected students one week before the survey. The email should include information about STRIKE and ask for students' support to complete an electronic survey, which will be sent by the evaluation team within a week. The email should also include any incentives you plan to use to encourage completion of the survey. The web address for the survey is http://www.hhp.ufl.edu/FACTS.
4. The introduction email should serve a purpose to verify the email address. Notify the evaluation team if there are any incorrect or undeliverable email addresses of selected students.
5. All sites are encouraged to provide an incentive for completion the survey (e.g., STRIKE phone card or other STRIKE items).
6. Site coordinator and staff should attempt to complete the survey first to experience the time it takes to complete the survey.
7. The evaluation team will send out the survey with a code number via email one week after the advance introduction letter. The evaluation team will responsible for tracking the responses.
8. A list of students who have not completed the survey will be provided to each site for follow up.

The research team selected a random list of 30 courses from the electronic course listings of each school choosing the in-class paper survey method. Permission was obtained from instructors to use their classes. If an instructor refused, another course was randomly selected. Campus coordinators provided various incentives such a movie passes, phone cards, and coupons to complete the surveys. The response rate was assessed by using the number of usable returned surveys divided by the number of surveys distributed. The guidelines for random in-class survey are listed below.

Guidelines for Random In-Class Survey (FACTS)

1. A list of randomly selected classes will be provided to each site.
2. Contact your registrar's office to verify the courses selected.
3. Select classes from the list until you reach 300 students.
4. Ask your Vice-President or Dean to write an introductory letter to request for cooperation and support to class instructors selected for survey.
5. Obtain instructor's permission to survey. If an instructor refuses to allow you to survey in the

classroom then ask for permission to distribute the survey only (before the class). Ask students to complete the survey at their own time and return the completed survey by campus mail or at a designated place in exchange for a gift. You can also ask students to bring back to class next time.

6. Skip to next class on the list if you are not successful in getting the instructor's permission to survey in the classroom or distribute the survey.
7. Receive a package of surveys from the evaluation team. Each package will contain 300 survey forms to be distributed to students in each class.
8. Site coordinator and staff should attempt to complete the survey first to experience the time it takes to complete the survey. (The survey should take only 15 minutes or less to complete.)
9. You are encouraged to provide an incentive for completion of survey (e.g., STRIKE phone card or other STRIKE items).
10. Collect the survey upon completion. Try to avoid collecting the survey on Friday.
11. Mail surveys back to the evaluation team. A specific instruction for returning the survey will be included in the survey package.

Results

The in-class administered surveys had the highest average response rate of the three methods (66%). In addition, the four schools that used this mode also had the highest response rates in the study. These schools did not use pre-notification or follow-up measures to increase response rate. Only one of these schools used an incentive. Mail surveys had the second highest response rate (23%). Two schools used this method and both used incentives. One school made two follow-up calls to students and the other school sent a follow-up letter. Web-based surveys had the lowest response rate (10%). Five schools used this method but only three used pre-notification measures. All five schools offered an incentive to students who completed the survey. Follow-up methods differed for each school. One school provided an email follow-up, two schools made two email follow-ups, and one school made two phone follow-ups. One school did not provide a follow-up contact.

Discussion

In-Class Surveys

This study showed a large disparity in response rate between the three survey methods. In-class survey administration had the highest response rate. This is a very popular survey method that traditionally yields high response rates (2-4). The classroom setting provides a captive audience and a quiet environment relatively free of distractions (2). In addition, this method is relatively inexpensive since it saves the cost of postal mailings and phone calls. Data can be processed almost immediately. The endorsement of the instructor also may provide legitimacy to the study in the eyes of students. Randomly selected classes capture all the above advantages plus it allows for generalization (2). Of course, the research question and adequate number of classes from which to sample will determine the appropriateness of this method.

A major drawback of in-class survey administration is the difficulty of obtaining a truly random sample of individuals. While a random sample of individuals can be selected by postal mail or email surveys, classroom surveys randomly select classes, not individuals. This mode also relies upon the cooperation of instructors and assumes that the day of the survey represents normal class attendance. Additionally, students may be more likely to provide a higher rate of socially desirable responses (2). In comparison to web-based surveys, in-class surveys may require additional data entry time and labor costs. These problems can be minimized by having students record their responses on electronic scan sheets.

Postal Mail Surveys

For this study, there was a very low response rate with postal mail surveys (23%). Postal mail survey is the most commonly used survey method in research studies. It also is a method that produces low response rates (5). Advantages of the postal mail method include the ability to randomly select participants and a lack of technical barriers that may exist in the use of telephone or web-based survey administration. In addition, it is an excellent way for dealing with sensitive issues. Disadvantages include a slower rate of completion, the cost of printing additional

questionnaires, the postage cost of initial and follow-up mailings, and the potential for non-response bias (4).

Postal surveys administered to groups with moderate levels of education, such as college students, have achieved response rates as high as 50 - 70% (6-8). It is not clear why the response rate for this study was so low. One possible explanation is that many students still use their parents' home address for their mail, rather than their off-campus address, so they may not have received the questionnaire. In addition, completing a tobacco survey may not be considered a priority to college students. Multiple mailings may have increased the response rate.

Web-Based/Online Surveys

The web-based survey had a very low response rate (10%). Many studies have found a lower response rate for web-based surveys when compared to traditional paper-and-pencil survey and mail surveys (9,10). One study (9) reported a 19% response rate in a study of college students. Other researchers have reported response rates comparable to those with mail surveys (11,12). However, some researchers believe that there is insufficient empirical data to assert that web-based surveys can consistently obtain response rates as great as mail surveys (13,14). The use of incentives or promotional tie-ins has been recommended to increase response rates (9).

Web-based surveys offer a faster dissemination, completion, and analysis rates than any other survey method (13,15-17). They also are relatively inexpensive to conduct, do not require trained interviewers, and eliminate the cost of postage (14,17,18). Web-based data collection also yields fewer socially desirable responses and fewer skipped items than other self-administered survey methods and can provide a relatively anonymous setting in which a participant may divulge personal information, yielding potentially more truthful responses (17).

Major problems with web-based surveys usually include a poorly designed survey, technical problems in administering and completing the survey, defining the survey population, adequate coverage of the population, and selecting a scientifically valid sample (15,18). This issue is minimized if students complete the survey on their personal computers. Coverage and sampling issues can be minimized with college students since most have access to computers and the Internet. Other potential obstacles to web-based survey administration, specific to the college population, include lack of computer experience, not checking email regularly, computer systems which purge old email regularly, the lack of a visual reminder, the potential lack of privacy for students who complete the survey in a campus computer lab and even the potential for socially desirable responses (11,18). Many students also tend to have multiple email addresses and this may have contributed to the extremely low response rate in this study (11). The response rate for this method may have improved if all schools had made initial and follow-up contacts. Also, following-up with another method other than email may have helped (19). One school chose to follow-up with phone calls.

Summary and Conclusions

This study had several limitations. Due to the nature of the contract between the funding agency and the schools, each school was responsible for distributing the surveys, making initial and follow-up contacts with students, and providing incentives. Thus, there were added levels of bureaucracy that limited the control of the research team. These issues have proved to be especially crucial for the postal mail and web-based survey methods. Therefore, it can be concluded that the response rates, especially for the postal mail and web-based surveys, were probably affected by how the questionnaires were administered by each school.

Based on this study, we recommend in-class survey administration with random class selection as a sound method for conducting survey research on college campuses. This method appears to be efficient, productive and simple, and does not allow for the occurrence of many of the difficulties and low response rates that commonly arise when other modes are used. As demonstrated by the high response rate obtained in this study, using the classroom distribution method was clearly the best choice.

Regardless of the survey method used, research done on college campuses also should consider the best time in the semester to conduct the survey. If conducted too early in the semester, the class rolls may be incomplete due to adding and dropping of classes. We recommend randomly selecting individuals and classes after the fifth week of the semester. Researchers also should be familiar with the academic calendar of each school and plan around mid-term exams, final exams, winter

break, spring break, homecoming, or other events, which may interfere with students' ability to give attention to the survey in a timely manner.

References

1. Rigotti NA, Regan S, Majchrzak NE, Knight JR, Weschsler H. Tobacco use by Massachusetts public colleges: Long term effect of the Massachusetts Tobacco Control Program. *Tobacco Control*. 2002; 11(2): 20-25.
2. Adams TB, Benzer JR, Drabbs M E. (2000). Conceptualization and measurement of the spiritual and psychological dimensions of wellness in a college population. *J Am Coll Health*. 2000; 48(4): 165-173.
3. Nunn CE. Discussion in the college classroom: triangulating observational and survey results. *J Higher Ed*. 1996; 67:243-266.
4. Baruch Y. Response rates in academic studies-a comparative analysis. *Hum Relations*.1999; 52: 421-434.
5. Dillman DA. *Mail and Internet Surveys: The Total Design Method*. NY: Wiley and Sons. 2000.
6. StatPac. Response rate and following up on nonrespondents. 2000. Available: http://www.statpac.com/surveys/response-rate.htm [Accessed December 10, 2002].
7. Schonlau M, Fricker RD, Elliott MN. *Conducting Research Surveys via E-mail and the Web*. Santa Monica, CA: Rand. 2001.
8. Dillman DA, Sinclair, MD, Clark JR. Effects of questionnaire length, response-friendly design, and a difficult question on response rates for occupant-addressed census mail surveys. *Pub Opinion Q*. 1993; 57:289-304.
9. Leslie TF. *1996 National content survey results.* Washington, DC: U.S. Bureau of the Census. 1996.
10. Wu HFM. *Use of web-based survey instrument to collect, analyze and present course evaluation data*. Unpublished doctoral dissertation. 1997. George Washington University, Washington, DC.
11. Houston JD, Fiore DC. Online medical surveys: Using the Internet as a research tool. *M.D. Computing*. 1998; 15(2): 116-120.
12. Pealer LN, Weiler RM, Pigg RM, Miller D, Dorman SM. The feasibility of a web-based surveillance system to collect health risk behavior data from college students. *Health Educ Behav*. 2001; 28(5): 547-559.
13. Mehta R, Sivadas E. (1995). Comparing response rates and response content in mail versus electronic mail surveys. *J Market Res Society*. 1995; 37:429-439.
14. Schaefer DR, Dillman DA. Development of a standard e-mail methodology: Result of an experiment. *Public Opinion Quarterly*. 1998; 62:378-397.
15. Sheehan, K. B. (1999). Response variation in e-mail surveys: An exploration. *J Advert Res*. 1999; 39(4): 10-11.
16. Bachmann D, Elfrink J, Vazzana G. Tracking the progress of e-mail vs. snail mail. *Market Res*. 1996; 8(2): 31-35.
17. Kittleson M. An assessment of the response rate via the postal service and e-mail. *Health Values*. 1995; 18(2): 27-29.
18. Tourangeau R, Smith TW. Asking sensitive questions: The impact of data collection, mode, question format and question context. *Public Opinion Quarterly*. 1996; 60(2): 275-304.
19. Dillman DA, Bowker DK. (2000). The web questionnaire challenge to survey methodologists . Available: http://survey.sesrc.wsu.edu/dillman/papers.htm [Accessed October 1, 2002].
20. Dillman DA, Phelps G, Tortora R, Swift K, Kohrell J, Berck J. 2001. Response rate and measurement differences in mixed mode surveys using mail, telephone, interactive voice response and the Internet. Available: http://survey.sesrc.wsu.edu/dillman/papers.htm [Accessed October 1, 2005]