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ABSTRACT

This paper discusses the advantages and limitations of administering a survey questionnaire via the Internet (i.e., using both Web-based and e-mail platforms). It also addresses particular issues faced by one researcher as a reflection on the use of this methodology. Highlighted are problems associated with the use of listservs, e-mail addresses, formats for downloading and compiling data, and the nonrandom nature of the resulting sample. (Contains 2 tables and 11 references.) (Author/SLD)

WEB-BASED SURVEYS:

GUIDING LESSONS FOR THEIR USE

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Abstract

This article discusses the advantages and limitations of administering a survey questionnaire via the Internet (i.e., utilizing both Web-based and e-mail platforms). Specifically, the paper addresses particular issues faced by one researcher as a reflection on the use of this methodology. Highlighted are problems associated with the use of listservs, e-mail addresses, formats for downloading and compiling data, and the nonrandom nature of the resulting sample.

Web-Based Surveys:
Guiding Lessons For Their Use

Introduction

Web surveys are an extremely promising method of data collection (Schillewaert, Langerak, & Duhamel, 1998). Witte, Amoroso, and Howard (2000) indicated that Internet research is "an area marked by great potential but also little experience." Specifically, the World Wide Web can be used as a resource for obtaining and efficiently processing large amounts of data, often the type collected as a result of administering a survey (Carbonaro and Bainbridge, 2000). Advantages of Web surveys include a high rate of response, short time frame for the collection of responses, and time and cost savings. The Web certainly addresses the need for a less expensive and more expedient method of data collection (Heflich & Rice, 1999 ; Schillewaert, Langerak, & Duhamel, 1998). Furthermore, several additional benefits of using the Web for data collection have been identified (Carbonaro and Bainbridge, 2000; Schillewaert, Langerak, & Duhamel, 1998). These benefits include a faster response, protection against the loss of data, easy transfer of data into a database for analysis, cost savings, convenience for the respondent, the possibility of wider geographic coverage, and a potentially better response rate— although this "advantage" is not uniformly agreed upon by the community of survey researchers (Matz, 1999).

While this methodology is relatively new among educational researchers, it remains all but unused at the K–12 level of schooling. The advantages of web-based survey methodology as outlined above could encourage teachers and administrators to explore this methodology as a realistic alternative to more traditional methods of gathering information. Through this methodology, schools might be able to collect needed "customer" data with greater efficiency and convenience, all the while saving valuable financial resources. For example, secondary schools often seek to gather information from parents, students, and other community members regarding perceived levels of satisfaction. Additionally, school districts typically conduct post-graduate surveys of former students regarding the adequacy of college preparation and associated college success, as well as employment status. With more and more districts moving toward "total quality" strategies in attempts to guide organizational improvement, a web-based methodology for data gathering seems to be a realistic alternative, especially from the perspective of efficiency.

However, it is important to note, as with any method of data collection, there also exist disadvantages. These include the potentially nonrandom nature of the sample, unavailability of population lists, computer access to the survey, and various technology-related issues. Additional limitations include the inability to clearly define the population, lack of technological familiarity on the part of respondents or their willingness to use a computer to complete the survey, the potential for being able to identify respondents, as well confidentiality and privacy issues for those respondents, and browser incompatibility problems (Carbonaro and Bainbridge, 2000; Schillewaert,

Langerak, & Duhamel, 1998; Shannon, Johnson, Searcy, & Lott, 2001). One of the most substantial concerns about Web surveys is the nonrandom nature of the respondent group (Witte, Amoroso, and Howard, 2000). However, the issue of nonrandomness is not unique to Web-based survey research and can be addressed through the maintenance of an accurate list of population members, when feasible. Taylor (2000) has suggested that we remember that online data collection is not based on probability sampling, but rather on "volunteer" or "convenience" sampling. Nonetheless, Young and Ross (2000) state that the use of the Internet to collect data may be one of the most profound developments in survey research.

Beyond the strengths and weaknesses of this methodology, Carbonaro and Bainbridge (2000) have outlined several other issues with which researchers should be concerned. First, access to the survey must be as simple as possible for all respondents. The more complex the process of completing the survey, the lower the resultant response will undoubtedly be. Second, the process must be designed such that respondents of the Web survey are able to complete it with the same relative ease as if they had received a traditional paper version. Third, some sort of security system is required, in order to maintain the integrity of the data, but also to put at ease the mind of the respondent. Finally, completion of the survey must require only minimal computer skills—including the ability to use and Internet browser, enter a specific URL, use a mouse, and type on a word processor. Matz (1999) also points out that a Web survey must somehow be publicized. Some mechanism must be used to direct potential respondents to the actual URL containing the survey.

There exists somewhat of a void in the research literature on the topic of electronic surveys, in particular, comparing their effectiveness to that of mail surveys (Underwood, Kim, & Matier, 2000). Often, the results of Web-based surveys differ when compared to written questionnaires and telephone surveys (Taylor, 2000), although Saphore (1999) found that there were no differences in the pattern of responses between a Web survey and an identical pencil-paper form of the same survey. Furthermore, he concluded that there were no differences in the psychometric qualities of the two forms of the survey.

In another comparison-type study, Matz (1999) compared the responses received from a Web survey with those received from a traditional pencil-and-paper survey. She found no significant differences between the demographic characteristics—such as age and gender—of the respondents completing the Web survey and those completing a mailed, written survey. Additionally, she found no significant differences between the content or pattern of responses for either group. The only significant finding—albeit, a substantial one—was that the overall response rate for the paper survey (43%) was significantly higher than that for the Web survey group (33%). A final result discussed by the researcher was that the paper instrument seemed to provide more flexibility to the respondents. They could freely make comments about items they did not understand or felt were ambiguous. In spite of these last two findings, she concluded that Web surveys seemed to be a reasonable alternative—or, at least, equally suspect—to mail surveys.

Underwood, Kim, and Matier (2000) also conducted an empirical study comparing the characteristics of Web and mail surveys. When the data from the administration of the same survey via two different media were compared, the researchers concluded that women responded at greater rates than men, regardless of survey method, and that underrepresented minority students generally responded at lower rates than Caucasians, Asian-Americans, and International students, also regardless of survey method employed. This led them to further conclude that the characteristics of respondents, rather than specific survey method used, are more closely related to response rates.

Even though their use is on the rise, much more empirical and experiential information is needed about the relative effectiveness of Web-based surveys, especially in the field of social science research. More research is needed regarding their efficiency, as well as their limitations. This paper attempts to document some of the advantages and limitations of data collection via the use of Web-based surveys, specifically from the perspective of one such survey research study which utilized this methodology. This paper chronicles the methodology utilized in a research study involving the collection of data via a Web-based survey, and focuses on the advantages and limitations of the methodology.

Method

The primary information for this paper was collected through the administration of a Web-based survey. The study involved the administration of the Teacher

Motivation and Job Satisfaction Survey to K-12 teachers (the survey can be viewed online at *http://personal.bgsu.edu/~mertler/TMJS-Survey/TMJS.html*).

Many of the difficulties encountered by the researcher occurred during the planning phase of the study, as opposed to the actual data collection phase. Therefore, it is important to outline the specific steps taken in conducting this study. Initially, teachers had to be notified of and directed to the Web site containing the survey. In this particular case study, individual email addresses were not available and the desire was to obtain a large sample; therefore, it was decided to attempt posting messages to listservs, or electronic discussion groups, which would direct individual teachers to the survey. Over several days, searches for educational listservs were conducted on the Web. Initially, 43 listservs were identified. Only 13 of these permitted the posting of the cover message (see Figure 1) to the entire listserv directing teachers to the survey. The 13 listservs who participated in the study are listed in Figure 2.

Insert Figure 1 about here

Insert Figure 2 about here

The survey was "housed" on a Web site called "Digisurveys.com" (*http://www.digisurveys.com*). Upon completing the survey, teachers simply clicked the

Submit Survey

button at the bottom of the page. They were transported to a "Thank you" page and their responses were submitted electronically in CGI script to a predetermined email address, where they were received as a text file. Each individual file was then filtered through a software program called Eform into a data stream and formatted into columns, which were then converted into ASCII format. The webmaster of Digisurveys.com provided the researcher with the ASCII file on disk, who then converted it directly in an SPSS data file.

Limitations of Web-Based Surveys

Several limitations of this specific methodology arose during the process of conducting this particular study. Four primary limitations are listed and discussed below.

Listservs and Email Addresses

The first major limitation involved the use of listservs, which was necessitated due to the lack of individual teacher email addresses. First, all listservs are subscription-based—that is, one cannot post a message to a listserv without first becoming a member of the list. This is typically not a problem; one simply sends an email message to the administrator of the listserv requesting membership. Within a day or two, confirmation of membership was received from all 43 listservs.

In an effort to save time, the first message posted by the researcher was sent to all 43 listservs simultaneously using a university email account (in other words, all 43 email addresses were entered in the "To:" line of the email message, separated by commas). This created serious problems. Within minutes, return messages were received from several of the listservs, each containing a message similar to the following:

> *"We have detected multiple simultaneous email messages sent from this address. We assume that you are trying to "spam" our listserv membership. You have been banned from posting any messages to this listserv for a period of two months."*

Obviously, this created some serious problems for the study at hand. Due to this banning, the initial cover message would not be forwarded to the individual listservs. The researcher was forced to create a Web-based email account for the sole purpose of conducting the study. The cover message was then successfully sent out to all listservs individually.

Everything seemed to be proceeding alright until a new wave of return email messages began arriving. The researcher then discovered that the administrators of several of the listservs had to review the content of the message prior to it being posted to everyone. After several days, messages were received from a subset of those stating that this was the type of request that they would not post to their respective listservs due to the fact that the memberships did not appreciate being inundated with this type of request. A beneficial aspect of joining the listservs is that one knows when your message has been posted since you also receive it as a member of the list. Some of the listservs

neither posted the message nor contacted the researcher; they just simply chose not to post it. After all of these unanticipated roadblocks, 13 of the initial 43 listservs (see Fig. 2) posted the message to their entire membership list.

Limitations of Technology

When this study was originally planned, it was the intent of the researcher to create a university account in order to electronically receive all of the teachers' responses. Upon making that formal request, it was discovered that Information Technology Services at the institution no longer provided CGI accounts due to the fact that students and others had learned how to "hack" into those accounts. Therefore, the researcher had to look elsewhere. There are several sites on the Web—such as "zoomerang.com" and "survey.com"—that allow you to customize your own survey and house it on their servers. Fortunately for the researcher, one such site—"Digisurveys.com"—is maintained by a former graduate student. All services—uploading the survey, writing the code for the relay of responses, and conversion into an ASCII file—were provided for a nominal fee.

This type of service can make the retrieval of data quite easy. However, one must make sure, at the outset, to carefully specify the format in which the data is to be received.

Lack of a Population List

Since the researcher desired to obtain a very large sample, and since individual email addresses were not available, an alternative had to be found. The idea of using

listservs was a good one, from both logistical and practical viewpoints. However, one can not be sure of the population that is being reached with the request to complete the survey posted on a listserv. For example, the population of interest for the study at hand was K-12 teachers. Some teachers were automatically excluded from the *opportunity* to complete the survey due to the fact that they were not members of the identified listserv, that the listserv administrator refused to allow the cover message to be posted, that they did not have an email address (which is required for membership on a listserv), or that they did not have access to or comfort with a computer, among others. This fact has obvious consequences in relation to the representativeness of the resultant sample.

- *Representativeness of the Sample Data*

Since no population list was available, it follows that it was not possible to select a *random*, representative sample. At best, this methodology—as used in this study—resulted in merely a sample of convenience. Obviously, one needs to be cautious when using Web surveys, especially when respondents are obtained via listservs, about generalizing the results to a larger target population. For purposes of this study, the researcher was confident in many of the results since they mirrored results of a smaller pilot study. The smaller study utilized the same survey items, formatted in the more traditional pencil-and-paper format.

Advantages of Web-Based Surveys

Additionally, several advantages of this survey methodology arose during the process of conducting the study. Four primary advantages are discussed below.

- *Number of Responses Received*

Although it was impossible to calculate a rate of return for the survey (without knowing the actual number in the population), the number of responses received exceeded the expectations of the researcher. In the fourteen days that the survey was "active" on the Web site, a total of 969 responses were received. Even if individual addresses had been available, one must question whether that size of return could have been achieved using more traditional survey methods.

- *Efficiency of Data Collection*

Difficulties typically associated with mail surveys encountered at both ends of the process are never realized when using this methodology. One does not have to factor into the process the amount of time it will take for the surveys to reach the intended respondent, nor the amount of time it will take for the survey to arrive back to the researcher. Additionally, there are no paper copies to keep track of or store following receipt of the completed surveys. Finally, the endless hours spent stuffing envelopes is not an issue with which one must deal when using Web-based surveys.

- *Non-Issue of Data Entry*

Probably the most meaningful time-saving feature of the Web survey is the fact that individual responses do not have to be manually entered into a data file. First, this reduces the chance of human error with respect to data entry. Second, manual entry of data is often a very time-consuming portion of the survey research process. However,

the use of Web-based surveys all but eliminates this step in the process. In essence, each respondent "enters" his or her own responses into the data file simply by clicking on "Submit." Finally, even if computer scannable response forms are used, the Web survey process is still more efficient.

Monetary Savings

Finally, the use of Web-based surveys can result in substantial monetary savings for the researcher. If this particular study had been conducted using conventional surveys methods, and if it had resulted in nearly 1,000 responses, the cost would have been substantial. Assuming that the cost for each survey would have been about $1 per person (this includes copying, postage, and envelopes) and a conservative return rate of 40%, the total cost of preparing, sending, and receiving the surveys would have been approximately $4,000. In contrast, this particular study cost the researcher $120. Additional savings could be realized if persons were employed for purposes of data entry and/or statistical analyses.

Discussion

Even though their use is on the rise, not that much is known about the relative effectiveness of Web-based surveys, especially compared to more traditional methods of survey delivery. More empirical research and related experiential information—such as that provided in this paper—is desperately needed to assist researchers and others who collect educational data in determining the efficiency of Web surveys, as well as shedding light on their respective limitations.

There are certainly research design issues of a theoretical nature which must be examined, such as the issues of representative sampling, the inability to accurately calculate a rate of response, and the resulting generalizability of the findings. Ideally, publicizing a Web survey through direct email messages would be ideal—and would have alleviated many of the procedural difficulties encountered in the study at hand. This would have permitted the researcher to report a response rate, and ultimately have greater confidence in the generalizability of the results. However, gaining access to a "master" list of email addresses is not always feasible. These are issues that the research community must resolve due to the increasing popularity and use of Web-based surveys.

In addition, there also exists a variety of practically-oriented issues with which researchers should be familiar prior to engaging in their own Web-based surveys. Simply designing and posting a Web survey will not automatically result in easier and more efficient data collection and management. Specific protocols must be followed; many of those protocols require particular types of software programs in order to facilitate the desired level of data management. In the case of this particular survey study, advice and expertise had to be sought outside of the researcher's home institution.

As mentioned earlier in this article, the advantages of web-based survey methodology could—and, many would argue, *should*—encourage individual schools and school districts to explore this methodology as a realistic alternative to more traditional methods of gathering information. The efficiency and cost-savings features

alone would make this methodology quite appealing to most administrators. Many school districts, as well as state departments of education, are moving toward the implementation of specific strategies for organizational improvement (e.g., the Baldrige Criteria for Performance Excellence, etc.), and strategic planning, customer service, and information analysis are key to meeting those goals. For example, the Ohio Department of Education is committed to having 100 school districts actively engaged in the Baldrige processes as a means of facilitating school improvement during the 2001-2002 school year (Ohio Department of Education, 2002). The concept of continuous school improvement relies heavily on the collection of accurate, meaningful, and timely information for purposes of revealing strengths and opportunities.

For teachers and administrators at the secondary level who wish to pursue the collection of information through the use of a web-based survey methodology, getting started is not too difficult. Initially, it is advantageous to have a staff member who is familiar with web pages and HTML code. If an individual with such expertise does not exist in your organization, technical personnel can be hired to write the code for your web-based surveys. Once specific items for the survey have been drafted, they must be translated into HTML code and uploaded to a web server by the technical personnel. The survey is then an "active" site and you can begin receiving responses immediately.

The purpose of this article was to share with survey researchers and others who are responsible for gathering organizational data many of the unanticipated barriers encountered in this particular case study, as well as many of the distinct advantages associated with the use of this methodology. Hopefully, this discussion has shed some

light on several of those important issues. Awareness of the distinct advantages and relative limitations of this survey methodology should improve its effectiveness and frequency of use.

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Figure 1. Cover Message for *The Teacher Motivation and Job Satisfaction Survey*

Hello, Everyone! I am currently conducting an online survey research study titled "Teacher Motivation and Job Satisfaction of Public and Private School Teachers", the purpose of which is examine the current levels of teacher motivation and job satisfaction for teachers.

The purpose of this email message is to ask for your participation in the study. The survey will only take about 4-6 minutes to complete. When you have completed the survey, simply click on the SUBMIT button to send your responses to me. Please make sure you submit your responses only once!

Please be assured that your responses will be anonymous and confidential. There will be no way for me to determine the origin of your responses. You will not be contacted for any further information. Additionally, no individual information will be shared; only aggregate results will be reported. Finally, due to the web-based nature of the survey, there exists a minimal chance that your responses could be intercepted while being transmitted.

Your participation in this study is voluntary. By completing and submitting the survey, you are giving your consent to participate. If you do not wish to participate, simply disregard this message. If you have any questions regarding this survey study, I may be contacted at mertler@bgnet.bgsu.edu.

I would like very much for you to participate in the study by completing the brief survey which can be found at:

digisurveys.com/Mertler

Please pass this message on to other teachers you know or direct them to the website. In advance, thank you very much for your participation in this research endeavor and best of luck in the remainder of your school year!

Best Regards,

Craig A. Mertler, Ph.D.

Figure 2. List of Participating Listservs

- Special Education Discussion List *SPECED-L@LISTSERV.UGA.EDU*
- AERA-K Division K: Teaching and Teacher Education *AERA-K@asu.edu*
- AERA-C Division C: Learning and Instruction *AERA-C@asu.edu*
- Kentucky K-12 Arts and Humanities Teachers Discussion List *KYARTS@LSV.UKY.EDU*
- KY Business Education Teachers *KYBUSED@LSV.UKY.EDU*
- Kentucky Geography Teachers *KYGEOG@LSV.UKY.EDU*
- Elementary Education *elemed@acpub.duke.edu*
- K-12 Educators Interested in Educational Administration *K12ADMIN@LISTSERV.SYR.EDU*
- Foreign Language Teaching Forum *FLTEACH@LISTSERV.ACSU.BUFFALO.EDU*
- Math Educators *mathsed-l@deakin.edu.au*
- English Teachers' List Secondary School level *TEACH-ENG-L@NETPALS.LSOFT.COM*
- For parents, teachers, and others concerned about education *ABLETECH-L@LISTSERV.OKSTATE.EDU*
- Beginning Teachers Network List *BTN@OED.OLD.GOV.AU*

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