The application of web-based survey research methods to longitudinal designs

Orland Hoeber, University of Regina
Harold Riemer, University of Regina
Kim Dorsch, University of Regina
Larena Hoeber, University of Regina

Traditionally, survey research methodologies have used the mail and telephone systems as the delivery and return medium for questionnaires. With the rapid growth of Internet access among the general public in the last decade, the online delivery and return of questionnaires has developed into an attractive alternative. In addition to providing an effective questionnaire delivery medium, a web-based survey instrument may also provide support for other research tasks including participant management, data validation, and automatic data coding.

The term 'online survey' has been used to describe many different types of survey instruments. Examples include a questionnaire sent and received via email (in text or as an attachment) (e.g., Mahony et al., 2004), a web page where participants download a questionnaire to be mailed in, or a web-based form where the results of the form are emailed to the researcher (e.g., Olberding, 2004). Some of these approaches have resulted in tradeoffs in the research process. For example, while a questionnaire delivered or returned by email lowers postage costs or decreases the time required to send and receive the 'mail', it may increase the time spent in data coding and management (i.e., sorting, printing, filing, and long term storage). Witmer et al. (1999) argue "researchers cannot merely import paper-and-pencil methodologies to on-line studies, but must adapt them to the electronic environment and create new methods" (p. 158). Moreover, many of these online techniques raise ethical concerns not typically present in more traditional survey research methods. For example, in web-based form submission approaches, unless care is taken to ensure the security of the questionnaire submission as well as the retrieval of the collected data by the researcher (i.e., from the web server to a traditional data analysis system) the confidentiality/anonymity of the participants and their responses cannot be guaranteed.

Researchers need to consider how technology and the Internet could be used to support the larger research process (i.e., questionnaire development/refinement, recruiting participants, questionnaire delivery and return, data management, data validation, data coding, etc.). Of particular interest is the balance between automation and human involvement (Shneiderman, 1998). For example, tasks such as participant recruitment may be better served in the human domain, whereas data coding is ideal for the electronic environment. One of the challenges in designing a web-based survey instrument is to emulate the positive features and principles associated with traditional survey research methodologies, and not force the use of technology on a task that is better suited to human work. In this presentation, we discuss the transformation and extension of traditional survey research methodologies, and the development of new approaches for conducting web-based survey research. We use the example of a longitudinal research project involving minors that makes use of both traditional (i.e., mail) and web-based survey research methods. Key issues discussed in the presentation are elaborated upon below.

Unless researchers are using existing questionnaires which have already established their reliability and validity in the current context, a necessary component of good survey research is the pilot testing of preliminary versions of the questionnaire packet (Fowler, 1993). We argue that this task of questionnaire development and refinement is not particularly well suited for a web-based survey system. Significant changes to the actual questionnaire are generally an important outcome associated with the piloting process. Making these changes in the 'paper and pencil' environment is relatively easy and inexpensive. Unfortunately, making these changes to web-based questionnaires necessarily requires programmer involvement, which is not only expensive but also time consuming. In the longitudinal study, the web-based survey research approach was not implemented until the pilot work had been completed.

In a similar manner, participant recruitment, often a critical component of research in general, may also not be well suited for a web-based environment. First, not all individuals in a given population will necessarily have access to

the Internet. If a research project is to have external validity then the sample must accurately represent the entire population. At this juncture in our history, web-based research is akin to the use of telephone research about 50 years ago when not everyone had access to a phone. Second, response rates to electronic (i.e., email) recruitment are low (e.g., Witmer et al., 1999). Given the amount of junk mail and the presence of spam filters, general messages of this nature are often ignored or do not reach the intended audience. The longitudinal project used a combination of mail and telephone recruitment and gave participants a choice of participating in the research via the web or traditional mail-survey techniques.

The web-based environment is ideally suited for the delivery and return of questionnaires in survey research. The system designed for the longitudinal research project allows the researcher(s) to assign new questionnaires to a participant group easily. Participants have instant access to any and all assigned questionnaires that have not expired or previously been completed. Further, once a questionnaire has been completed and submitted, the data is instantaneously available to the researcher(s) in coded form. The online system presented also has built in safeguards and prompts (i.e., indications of the location(s) of incomplete data in the questionnaire) to ensure that all items/questions are completed and contain valid data before submission can occur. In other words, this web-based survey system minimizes the amount of incomplete data returned; something that is often a problem with traditional mail survey approaches.

Longitudinal studies in general, and this one in particular, present unique participant management challenges that can be more easily managed using a web-based system. This system allows the researcher(s) to (a) maintain personalized contact with individual participants as well as participant groups (e.g., all players, all parents), (b) track submission status (e.g., who has submitted questionnaires, who has questionnaires in progress, who has yet to begin), (c) provide reminders (e.g., to individuals who have not yet started or completed an assigned questionnaire), (d) matching multiple questionnaire to a participant (e.g., time 1, time 2), and (e) matching multiple questionnaires from members of the same family group (e.g., from the player, the parent(s)).

Finally, the presentation will highlight how the longitudinal research project handled some of the issues associated with the ethical treatment of human subjects in general, and minors in particular. The web-based system was designed to ensure participant confidentiality and anonymity through the use of (a) encrypted transmission of participant submissions, (b) encrypted retrieval of the data by the researcher(s), (c) email transmissions delivered on an individual basis, and (d) requiring login to a secure website using passwords. More traditional means were used to collect documents that required a signature (e.g., consent forms).

KeyWords: Research Methods, Web-based, Internet, Longitudinal, Survey

Thursday, June 2 2005
8:30 AM - 8:55 AM
25-minute oral presentation

Category/Research Type: Research; Methodology