Simulation in the College Classroom: Enhancing the Survey Research Methods Learning Process

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In a typical higher education research course, the instructor is often unable to offer students a full survey research experience due to time, resource, and budget constraints. Even if the context of the survey study is manageable during the timeframe of the semester and appropriate resources are available, the cost of actually collecting data is not always financially feasible for most students. This presents a challenge for educators to create projects that permit students to learn and practice important research skills within given constraints.

In this article, we document our reflections and those of our fellow students in a graduate research class as examples of how using the simulation method has the potential to enhance learning about survey research methods. A simulation project was conducted in two different graduate-level courses at New York University using the same Web-based survey tool, Survey Monkey, as a way to enhance class survey research projects and support students' experiential learning processes. Findings revealed that simulation projects helped students experience the full range of a survey research effort—from initial problem development and survey construction to survey distribution and data analysis. Additionally, because of the ability of the survey tool to offer immediate feedback, simulation via similar tools seems to be a better instructional fit than more traditional instructional methods, since it provides a more definitive construct from which focused classroom discussion and teacher guidance can evolve.

For students learning research survey methods, the numerous steps associated with the survey creation, data collection, and analysis process can be daunting. In a typical higher education research course, the instructor is often unable to offer students a full survey research experience due to time, resource, and budget constraints. A standard semester length of 14 weeks might not permit enough time to teach and provide practice for developing an instrument and collecting and analyzing data. In addition, lack of instructor experience with newer technologies that can augment the data collection process might be a hindrance. Even if the context of the survey study is manageable during the timeframe of the semester and appropriate resources are available, the cost of actually collecting data is not always financially feasible for many students. This presents a challenge for educators to create

projects that permit students to learn and practice important research skills within given constraints. In this article, we document both our reflections and those of our fellow classmates as examples of how using the simulation method can enhance learning about survey research methods.

In a survey research course, one method of supporting students' experiential learning is to

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offer a simulation project, which "entails enacting a skill within a context, often created by the teacher, that mirrors the real-world contexts in which the skill is used" (Byerly, 2001, p. 697). The simulation method discussed here was utilized in two different graduate-level courses at New York University in 2004 using the same Web-based survey tool, *Survey Monkey*, as a way to enhance class survey research projects and support students' experiential learning processes. Experiential learning supports a student's ability to "learn by doing" and provides the opportunity to develop new skills through guided practice and feedback (Alon & Cannon, 2000).

Web-based survey tools are widely available on the Internet and can be used for the simulation method to enhance students' learning about research methodology. The two class projects described here are examples of how the use of a Web-based survey tool enhanced the students' learning processes in a doctoral-level statistics class and a graduate-level business management course.

Using a Web-based survey tool as the means by which students collect survey data from actual participants is the conduit to simulation of a full research endeavor. These simulated activities provided the students with a view of the entire research process from initial research problem development and survey construction to survey distribution and data analysis. Additionally, through this simulation project, students had exposure to common research issues, such as what to do about missing data and how to improve on completion rates of responses. Through experience with these potential problem areas, opportunities for richer and deeper learning arise. Active participation by students in the learning process can help them develop critical awareness of themselves and the environment around them (Jakubowski, 2003).

Web-based Surveys Tools

The past few years have shown a dramatic growth in Web-based tools that enable individuals and organizations to quickly create, distribute, and collect information in a survey format. Such data collection tools have become more accepted by

social scientists as the use of these tools grows due to habituation, as does the associated use of electronic forms of communication. This growth has also been embraced on higher education campuses, where numerous universities now offer their own version of Web-based survey tools created with Open-Source software. Open-Source tools, such as *asset* (Academic Survey System and Evaluation Tool) offered by Seton Hall University, are free to any user ("asset," 2005).

Moreover, new forms of communication technologies, specifically Web-based survey tools, present a path to ease the tensions associated with a survey research endeavor. Such tensions include the cost of data collection and storage, data errors, missing data, and response rate.

Researchers have analyzed the cost of survey projects and found Web-based surveys to be less expensive than traditional "snail mail" while using fewer resources (Truell, 2003). The postal and printing cost of survey research can be high, especially if the researcher is sending out multiple reminders. According to Salant and Dillman (1994), multiple participant contacts require a four-step mailing procedure. This four-step mailing procedure includes advance warning and reminder notices in order to achieve the desired response rate. Printing costs alone in a four-step mailing process can be substantial. For example, the discussed statistics class project may have required sending out 200 paper-based surveys to achieve a 50% response rate of 100 respondents. For a graduate student or a researcher, this could be a major financial hurdle.

However, Web-based survey tools are not totally free unless they are provided through an Open-Source agreement or through a trial offer. Commercial Web-based survey tools require a nominal monthly subscription fee with most offering trials before requiring the fee. For the membership, the researcher can send as many e-mail invitations and reminders as desired and collect unlimited responses. No additional costs for development or distribution are required.

Data entry errors in research studies that involve the transfer of collected data into analytical software tools are common. The ability to download data from a Web-based survey tool directly to an analytical software tool reduces the

potential of human error. This can save an enormous amount of time for the researcher but, more importantly, reduces any possibility of data transfer errors. Data integrity is paramount in any statistical research effort. In addition, the ability to require answers from participants (forced answers) is one way to reduce the tensions associated with missing data points.

One key benefit of Web-based survey tools is the ability to reach populations across geographical locations and have responses returned quickly (Dillman, 2000). A review of Web-based survey tools used in research efforts found faster response rates (e.g., 9 days with a Web survey compared to 16 days with postal mail) and a higher completeness of collected data (Truell, 2003). Several studies have noted dramatically fast return rates: "85% of the surveys in the study were returned within one week of the initial and follow-up survey distributions" and "89% of e-mail/Web survey respondents completed the survey within five days" (Truell, p. 32).

Response rates are a key indicator of survey success. In his review of resources used for research, Truell (2003) found studies that ranged from 34.5% to 84% response rates for Web survey tools. Other studies found that using both e-mail and a Web survey tool seemed to produce a higher response rate compared to just using one method (Schonlau, Fricker, & Elliot, 2002). In comparing response rates, returns were about the same for U.S. mail and e-mail survey groups, yielding 58% (Dillman, 2000). However, other researchers have found contrasting data, suggesting the need for more examination of the use of Web-based tools in survey data collection (Dillman; Salant & Dillman, 1994; Schonlau et al.).

The Internet presents a promising vehicle to conduct survey research as the population of Internet users grows (Dillman, 2000). Estimates show that 60% of the adult population in the United States today has Internet access from home or work (Tourangeau, 2004). However, researchers need to be aware of considerations when using the Internet for surveys. Most significant is the consideration of access to the Internet by survey respondents (Tourangeau).

Any study involving participants who do not have access to the Internet would preclude their participation, but this is not the case with the examples presented here.

Technical difficulties have also been reported in studies where the Internet was used for survey response, such as server time-out (the computer that houses the survey), ID and password confusion, and differences in how surveys display on different types of computer monitors (Truell, 2003). Despite possible limitations, Internet-based tools seem to be appropriate tools for class projects because of the Internet/e-mail proficiencies of the current student population, proliferation of communication technologies in the general population, and the ease and speed of the data collection process.

Survey Monkey Tool

Survey Monkey, a Web-based survey tool, was used for two graduate class projects: one was assigned in a doctoral-level statistics course and the other was assigned in a graduate-level business management course ("SurveyMonkey.com," 2004). *Survey Monkey* was chosen because on cursory review, it appeared easy to use and was reasonably priced with the offer of a free trial. The free trial provided up to 10 questions and 100 survey responses—a good fit for the simulated research endeavors.

While this tool is not primarily targeted for academic research purposes, notable benefits present strong consideration to graduate students and academic researchers for use in research survey efforts. Characteristics of this tool include ease of use for creation of survey, simple distribution of the survey over the Internet, real-time summary of collected responses, and the ability to download data in multiple formats for further statistical analysis (Excel or SPSS). The use of *Survey Monkey* reinforces principles of effective surveys as outlined by Dillman (2000), such as allowing questions in conventional formats. A fairly wide selection of question styles and formats—such as Likert-style questions, drop down lists, free form essays, multiple response items, and matrix questions—is offered to the

researcher. Creating survey items is a fairly easy learning process, since it is, for the most part, intuitive.

Additionally, the tool allows the creator flexibility in controlling features that might be desirable in a survey. For example, survey items can be designed to force an answer from the respondent before moving on. This might be a key strategy to reduce missing data points—a common issue in survey efforts. The data analysis section automatically generates graphs for each answered question, providing a visual orientation of the data. If the researcher desires, survey results can be shown to all participants without giving full access to survey functions. Skip logic is also an available feature that allows the user to customize the path that respondents take by skipping non-applicable questions to avoid respondent confusion. Yet another advantage over the paper-based survey is that *Survey Monkey* can randomize answer choices.

Class Project Examples

Introduction to Doctoral Level Statistics Course

The final project in this course required a demonstration of appropriate statistical analyses based on students' collected data. At the beginning of the semester, a research problem and a research question were developed after forming small groups of four students. The research question asked if innovative organizations performed better than their competitors, using the learning organization dimension as the independent variable and climate for innovation as the dependent variable.

Two validated paper-based survey instruments were found to support the research problem. Both paper-based instruments addressed the concepts of a learning organization and climate of innovation. Both were converted to a Web-based format using the *Survey Monkey* tool. The survey consisted of two separate sections for each of the two concepts being measured.

The first survey instrument, *Dimensions of the Learning Organization Questionnaire* (Watkins & Marsick, 1997), measures the behaviors of a learning organization across seven dimensions (continuous learning, inquiry and dialogue, team learning, embedded systems, empowerment toward a collective vision, connection of the organization to its environment, and strategic leadership). This validated instrument has been used in research studies with sampling retrieved across multiple industries and business segments (Ellinger, Ellinger, Yang, & Howton, 2002; Hernandez, 2000; McHargue, 1999). This project used a shortened version of this instrument consisting of 21 questions. The adjusted Goodness of Fit Index for the shortened version measures .808, which has a higher fit index than the original 43-item instrument of .567. The reliability estimates across the seven dimensions range from .60 to .87 coefficient alpha (Ellinger et al.).

The second survey instrument, the adapted *Climate for Innovation* measure (Scott & Bruce, 1994), consists of 26 questions using a Likert scale that measures support-for-creativity, tolerance-for-differences, resource supply, and reward-innovation dependency. The instrument was originally created by Siegel and Kaemmerer (1978). Cronbach's alpha for the *Climate for Innovation* measure is .92 (Scott & Bruce). The widely accepted social science level for alpha is .70 or higher for a set of items to be considered a scale/index, because at .70, the standard error of measurement will be over half of a standard deviation (Stangor, 1998). In other words, the higher the alpha score, the more reliable the index is said to be. A total of 13 items were selected from the adapted version for this project. Therefore, the 21 questions from the DLOQ and the 13 items from the CI questionnaire formed the survey instrument used for the class project.

Students used a sample of convenience, specifically their professional and personal contacts who worked for various U.S. corporations with more than 100 employees. After the conversion of the instruments to a Web-based format via *Survey Monkey*, a link to the online survey was e-mailed to the sample, inviting them to fill out the survey during a three-week period in the spring of 2004. Snowball sampling was used, where contacts were encouraged to forward the

e-mail containing the survey link to colleagues at the same company. Snowball sampling refers to the process of data collection through an accumulation of data as each subject suggests other subjects (Babbie, 2001).

The e-mail message described the voluntary nature of the survey and that it was specifically for a class assignment and not an actual research study. It was also stated that no personal information would be tracked or recorded and the responses collected would be anonymous. Seniority levels and specific titles were not required to be specified since the instrument was designed to span across multiple levels and titles. Specific industries were also not required as prior studies of learning organizations and climate for innovation spanned across industry segments.

After the three-week data collection period, the responses were downloaded to a statistical software program for analysis. Students collected a total of 103 responses for this class research project. Within the analytical software, they recoded and evaluated internal reliability for the two separate sections of the instrument. Acceptable alpha coefficients were found for the 21 items of the learning organization (.946) and for the 13 items measuring the climate of innovation (.926). Linear regression was calculated and an R square of .46 was found, indicating a significant influence of the learning organization factors on climate of innovation.

According to the analysis, this is a significant finding. This finding confirms the research that states that a learning organization provides the foundation for the continuous learning and the change necessary for survival in rapidly changing business conditions. Despite the significant finding, this effort was a student learning project used to demonstrate the student's ability to appropriately analyze the data collected. Results should not be interpreted otherwise.

MBA MANAGING HIGH PERFORMANCE TEAMS COURSE

The final project assigned in this course required a literature review, identification of key components, a field study, and a gap analysis on the concept of team leadership in organizations.

This was a group project consisting of four participants who together decided to focus on the key components of leadership styles and leadership roles.

After a review of literature was conducted and key components were determined, the group developed survey items. These survey items consisted of questions that were aimed to elicit information about leadership styles and leadership roles of team leaders within different organizations. The survey items were then reviewed with the course instructor. This review was a valuable component to learning as it provided an opportunity for a specific, focused conversation with a research professional. The survey was then formatted using the *Survey Monkey* tool.

An e-mail message, consisting of a brief description of the survey and its purpose as a class project and containing a hyperlink to the survey, was sent to a specified list of respondents. Students created the e-mail list, which included their personal business contacts—a sample of convenience. These personal business contacts held positions in various industries, such as financial services, pharmaceuticals, telecommunications, consumer goods, media, and entertainment. Survey recipients responded to 24 survey questions, which focused on participant observations of the characteristics of team leadership in the workplace. Respondents based their answers on a current or previous personal experience of working on a project team that included different people from multiple areas of the organization. The results of this survey were then compared to the characteristics of effective team leadership found in the review of literature. A total of 30 participants responded to the survey.

The first key component for this class project was leadership styles, specifically transactional and transformational leadership styles, that can positively influence team effectiveness (Bennis & Powell, 2000). Transactional leadership focuses on the accomplishment of tasks and good worker relationships in exchange for desirable rewards. The leader forges these relationships to motivate team members to achieve results. Transformational leadership occurs when the

leaders and followers support and encourage each other to achieve higher levels of motivation and morality. Transformational leaders enable team members to rise above selfish interests and achieve results for the benefit of the team (Kuo, 2004).

The second key component was leadership roles. Effective leaders exhibit eight leadership roles simultaneously and separately. These eight roles are coordinator, monitor, facilitator, mentor, innovator, broker, producer, and director (Denison, Hooijberg, & Quinn, 1995). The effective team leader illustrates the contradiction of different leadership roles through setting the goals, direction, and vision of the team while ensuring that resources are allocated efficiently. This same team leader assists the team with developing and training members, encouraging project completion, and solving team conflicts.

Survey findings showed that leaders from the sample did exhibit many of the essential elements of a high-performance leader. For example, many leaders demonstrated transformational styles of leadership by exhibiting charisma (55%), drive and desire (45%), and the ability to encourage team members to reach higher levels of performance (45%). Transactional style behaviors were also present with an overwhelming percentage of leaders having coordinator (73%) and director (72%) abilities.

Leaders from the sample exhibited all eight roles considered to be essential for a high-performance leader to master. In addition to the coordinator and director roles, leaders in the study also exhibited facilitator (65%), innovator (45%), and monitor (45%) roles. Another 45% represented motivators: 27% as mentors or producers and 18% as brokers. Based on the literature, it is a combination of styles and roles that help individuals become effective leaders. Leaders in this sample were able to demonstrate many good aspects of leadership styles and roles. Again, this effort was a student learning project used to demonstrate the student's ability to appropriately collect and analyze data. Results should not be interpreted otherwise.

Conclusions

The simulated projects in both classes provided a depth of learning that could not be accomplished through more traditional and formal instructional methods, such as lecture. The value of these simulated experiences was the sequential, hands-on component. The step-by-step process of creating a problem statement, formulating research questions, finding and reformatting instruments, collecting data, and analyzing results provided a new awareness of the steps involved in a research endeavor, the problems that can occur, and the skills required. It took on an importance and an excitement for students, who felt much like a trapeze artist taking their very first leap, all the while attached to a tether (the instructor).

A Web-based survey tool is beneficial to students, because it serves as a catalyst to learning. Because of the tool's speed, accuracy, and low cost, students are better able to partake in a simulated learning experience from start to finish. This process provides a framework of experience that is deeply needed in graduate education as students prepare for the next step: their thesis, their dissertation, or the workplace. Experiential learning may assist students in developing knowledge and critical-thinking skills that may be applied to different situations (Byerly, 2001). This experiential learning process provides a way to ground the research methodology textbook material with a concrete experience.

An example of the speed in which data were collected is the statistics project that produced a total of 103 responses in a span of under three weeks. Using more traditional means of survey dissemination, specifically the U.S. postal service, might require up to two weeks (with a second reminder notice) *before* individuals even notice and fill out the survey (Salant & Dillman, 1994). Additionally, Dillman (2000) found that e-mail responses were returned more quickly than postal service responses, and 76% of all completed responses were returned within four days. Since the tool provides immediate feedback regarding

the status of the project, students informally reflected on the excitement they felt when they saw responses coming in as participants completed their surveys. They remarked that they could *see* the data collection process unfolding before their eyes. In addition, all 103 responses were complete (no missing data), thereby illustrating one of the main benefits of using this electronic survey tool.

In ad hoc conversations with our classmates, the aspect of working in a group setting was noted as particularly helpful for them to learn more about research methods. The interactive exchange of student ideas provided a thoughtful base from which research questions and survey items emanated. Additionally, students felt that the opportunity for focused student-instructor conversations was critical for their deeper and accurate understanding of research methods. These remarks confirm literature findings that consider a participative learning process that encourages student exploration, invention, and application as key to experiential learning (Alon & Cannon, 2000).

In informal conversations in the doctoral-level statistics course, students reported a sense of relief and accomplishment after completing their projects. They perceived the simulated project as a sort of trial that provided them with not only an inside look at how the research cycle process worked but, more importantly, with a sense of confidence that they could take into their actual dissertation studies. Students reported that without this simulated full research endeavor that included the use of a "speedy" collection tool, they would have had lingering questions about the research process and, perhaps, remaining anxiety. None of our conversations focused on the *Survey Monkey* tool, but rather on it being a research process conduit.

Students in the business class setting were mostly MBA students interested in practical approaches to problem solving, not necessarily how online survey tools could be used for formal research efforts, such as a thesis or dissertation. Therefore, the simulated research project using an online survey tool provided insight to these students insofar as how the factors of low cost and rapidity of responses could assist their managerial

decision making. They also reflected on the simplicity of use of this Web-based survey tool. Students left the learning experience equipped with a valuable problem-solving and decision-making tool.

Next steps include a recommendation to graduate educators for the inclusion of simulations in research methods courses. Although the experiences described within are narrowed to survey research, we believe that other forms of research methodology could also use simulation methods to enhance students' learning processes.

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